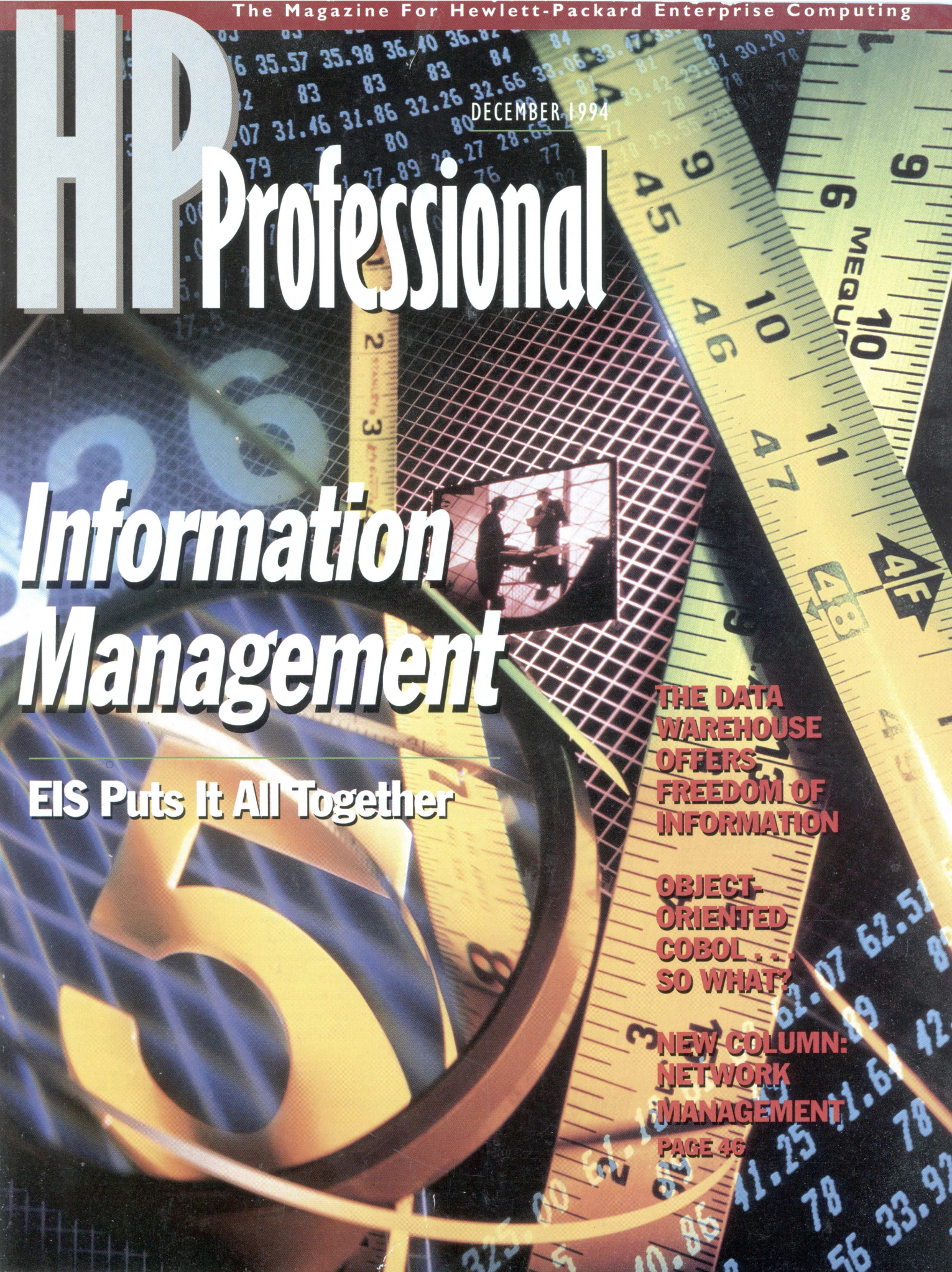
The Magazine For Hewlett-Packard Enterprise Computing

# HP Professional

DECEMBER 1994



# Information Management

## EIS Puts It All Together

THE DATA WAREHOUSE OFFERS FREEDOM OF INFORMATION

OBJECT-ORIENTED COBOL . . . SO WHAT?

NEW COLUMN: NETWORK MANAGEMENT

PAGE 46

# STORAGE NEEDS GETTING A LITTLE OUT OF HAND?

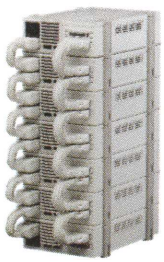



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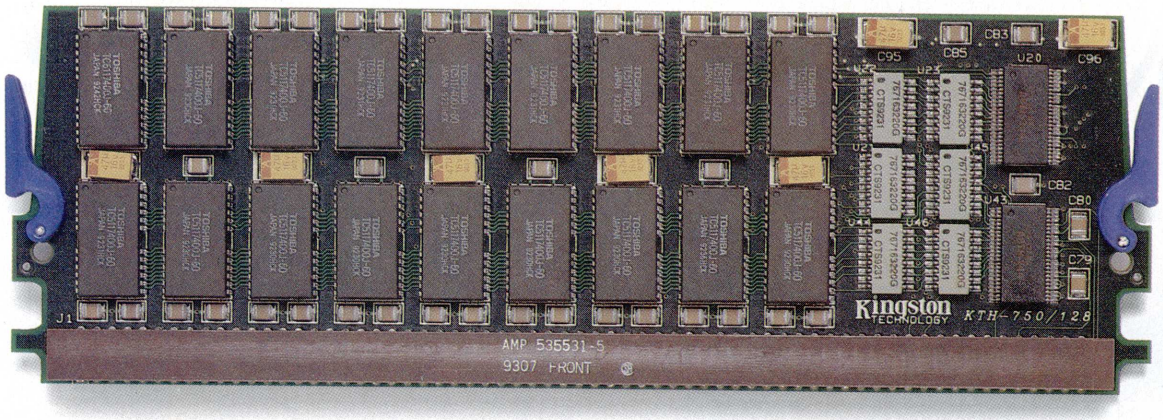
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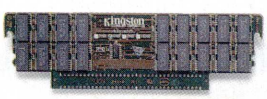
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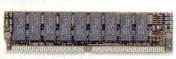

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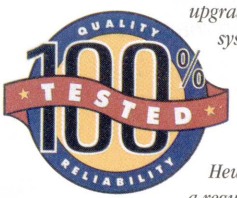




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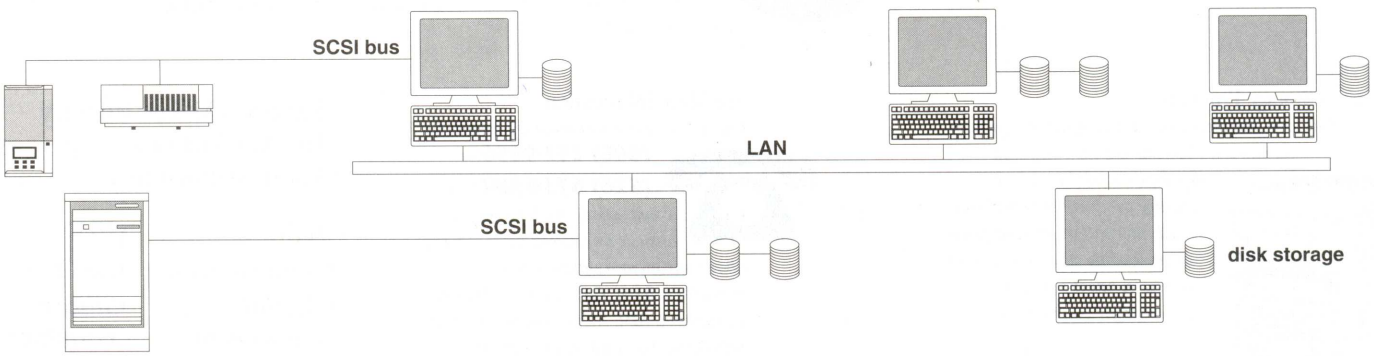
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**CIRCLE 122 ON READER CARD**

# Contents

December 1994

Vol. 8, No. 12

## An Information Coup

28

By George A. Thompson

*The old data processing aristocracy is gone. For a new age of information revolutionaries armed with data access tools, the enterprise is their oyster. How many pearls will they find?*

## The House That Data Built

36

By George A. Thompson

*After spending the past 50 years collecting data, IS managers are finally learning to liberate it by building data warehouses.*

## Oh, Oh . . . Cobol

42

By Gordon McLachlan

*Some say it's a menace. Some say it's a godsend. Our philosopher/reviewer delves into the mystery behind the Object-Oriented COBOL debate.*

### COLUMNS

Network Management: Tornado Watch At HP
*By Jill Huntington-Lee*
In The Eye Of The Network Management Storm, It's Smooth Sailing For HP's OpenView ..... **46**

PC Tips: DiffereNT Configurations
*By Miles B. Kehoe*
CONFIG And AUTOEXEC Files Need To Be Different For MS-DOS And Windows 3.1 Applications ..... **48**

Objectively Speaking: Understanding Inheritance
*By Richard Riehle*
A Parent And Child Reunion Is Only An Object Away ..... **52**

UNIX SYS_ADMIN: Looking For That Process
*By Fred Mallett*
Tips On Aliases, Dual Named Binaries And Uptime ..... **56**

And Another Thing: The Best Laid Plans
*By Gordon McLachlan*
Project Planning Is As Easy As 1 . . . . . 2, 3, 4, 5 ..... **72**

Editorial ..... 7

Industry Watch ..... 8

Letters To The Editor ..... 14

INsites ..... 26

New Products ..... 59

Reader Information ..... 65

Product Showcase ..... 68

Advertiser Index ..... 71

### PRODUCT WATCH:

Apertus Technologies' Enterprise/Access ..... 16

Imperial Technology Inc.'s MegaRam Solid-State Disks ..... 18

Inference Corp.'s ART*Enterprise ..... 20

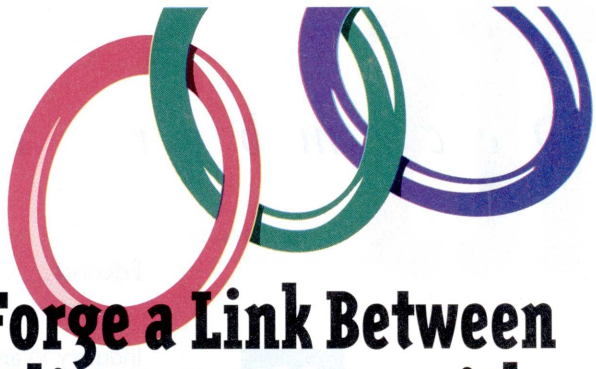
Locus Computing Corp.'s PC-Interface ..... 22

### STRATEGIC DIRECTIONS:

Visual Numerics Inc. ..... 24

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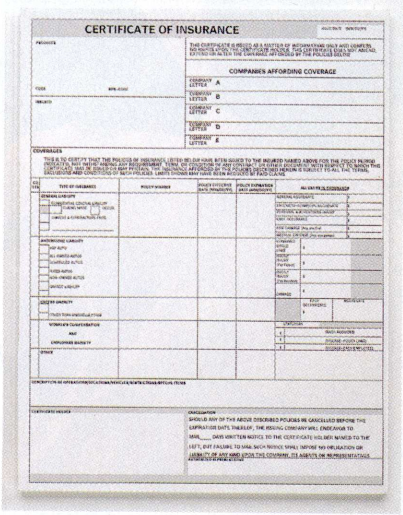

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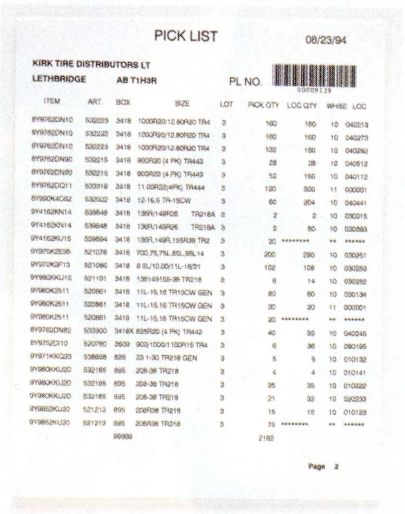
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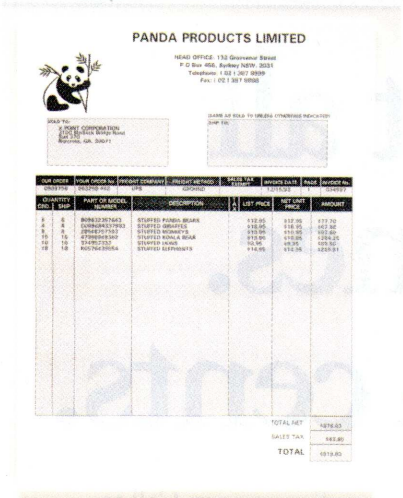
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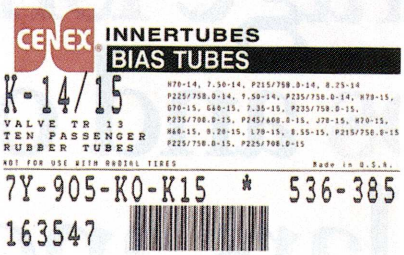


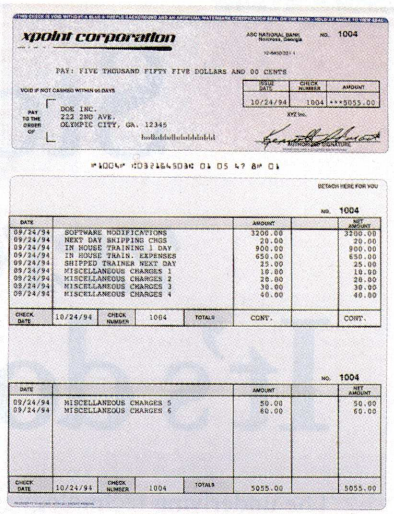






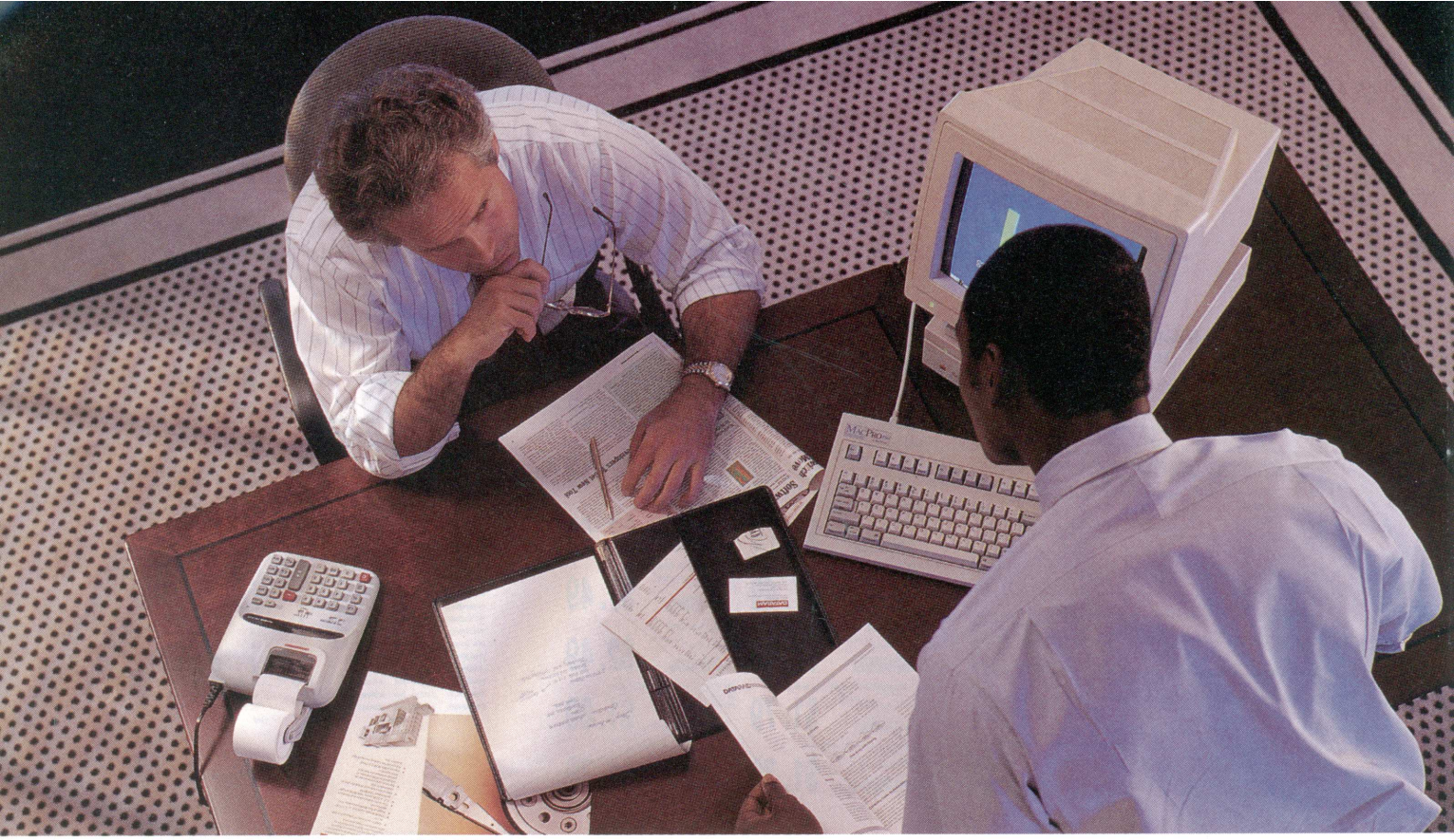

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# The Evolution Resolution

## The Winds Of Change Blow Once Again At HP Pro



By Charlie Simpson

As IS managers and directors, you understand change. And, we understand you. So in 1995, *HP Professional* evolves its editorial focus to cover the ever exciting, challenging and growing world of interoperability and internetworking in the HP enterprise computing industry. According to our reader surveys and our Editorial Advisory Board, this is where the future of computing lies and where you'll require the most information.

Like HP computing itself, *HP Professional* magazine must constantly change, adjust and refocus to provide you with the most current practical information about strategies, methods and products that you need to get your job done.

For example, this month we preview Jill Huntington-Lee's new column "Network Management." With over 11 years experience in computer and data communications, Jill will focus her column on network management, product analysis and the management of distributed UNIX environments.

In 1995, we will feature Gordon McLachlan, of "And Another Thing..." fame (or infamy), in our new "Standards" column, introduced this past September by Technical Editor George A. Thompson. Also, keep an eye out for new writers and columnists in 1995 such as Jim Esch, as well as continued contributions from favorites like Fred Mallett and Marty Poniatowski. In addition to these regular columnists and writers, expect insightful contributions from our Editorial Advisory Board.

In addition to providing you with more to read, we're giving you a chance to be heard. Beginning in February, as Gordon shifts into Standards mode, we'll open up our back page to our readers. As I mentioned last month, if you have tips or secrets, arguments or points of view that you want to share with colleagues, we'll publish relevant articles that can help other HP professionals in their day-to-day efforts to keep the enterprise efficient and productive.

We are expanding our feature article line-up to include issues such as PC-to-UNIX integration, groupware, DCE/9000, client-server E-mail and HP 3000-to-UNIX integration. In fact, we are dedicating the first issue of 1995 to one of the hottest topics in computing or any industry for that matter — service and support.

Finally, in 1995, *HP Professional* will premier our Open Systems Focus sections. These sections are designed for IS managers struggling with new technologies and management problems inherent in building enterprise-wide architectures. The Open Systems Focus sections will emphasize distributed computing, internetworking and multiplatform integration. Look for the first of these special sections in April 1995.

Remember, our purpose is simple, to help you make strategic decisions by providing unbiased analysis and evaluation of the HP computing market. Thank you for reading *HP Professional* in 1994 and we look forward to hearing from you in 1995.

Charlie Simpson

simpson@cardinal.com

George A. Thompson

# HP Storage Gets Branded

In October, HP took two big steps in the direction of becoming a recognized name in the reseller channel. First, HP's Mass Storage Group, created only this past April, was renamed the Information Storage Group (ISG). Second, the newly named ISG announced several new products under a new brand name called SureStore.

Roger Archibald, the ISG's marketing manager, hopes that the SureStore brand name will become as familiar and as respected as LaserJet has become for HP printers. Archibald, who was involved in marketing the HP LaserJet says, "We are taking the same focus on end users. And that means HP quality and reliability. That's what people want."

In October 1993, HP signed agreements with three national distributors that added 10,000 resellers with access to HP's storage products. For those resellers, brand name recognition will play a big part of their success. According to HP's research, a brand name is specified 68 percent of the time by those buying storage products through the reseller channel. "The solution is now defined at the reseller level," concludes Archibald.

"Brand awareness could increase HP's business by about 20 to 30 percent," according to Nathan Thompson, chairman of Spectra Logics, an HP OEM tape drive reseller. HP already has a strong brand name with its Colorado Memory Systems Division (Loveland, Colo.) with tape products designed for the small office market. "Colorado will eventually become a brand of HP and later under SureStore," says Archibald.

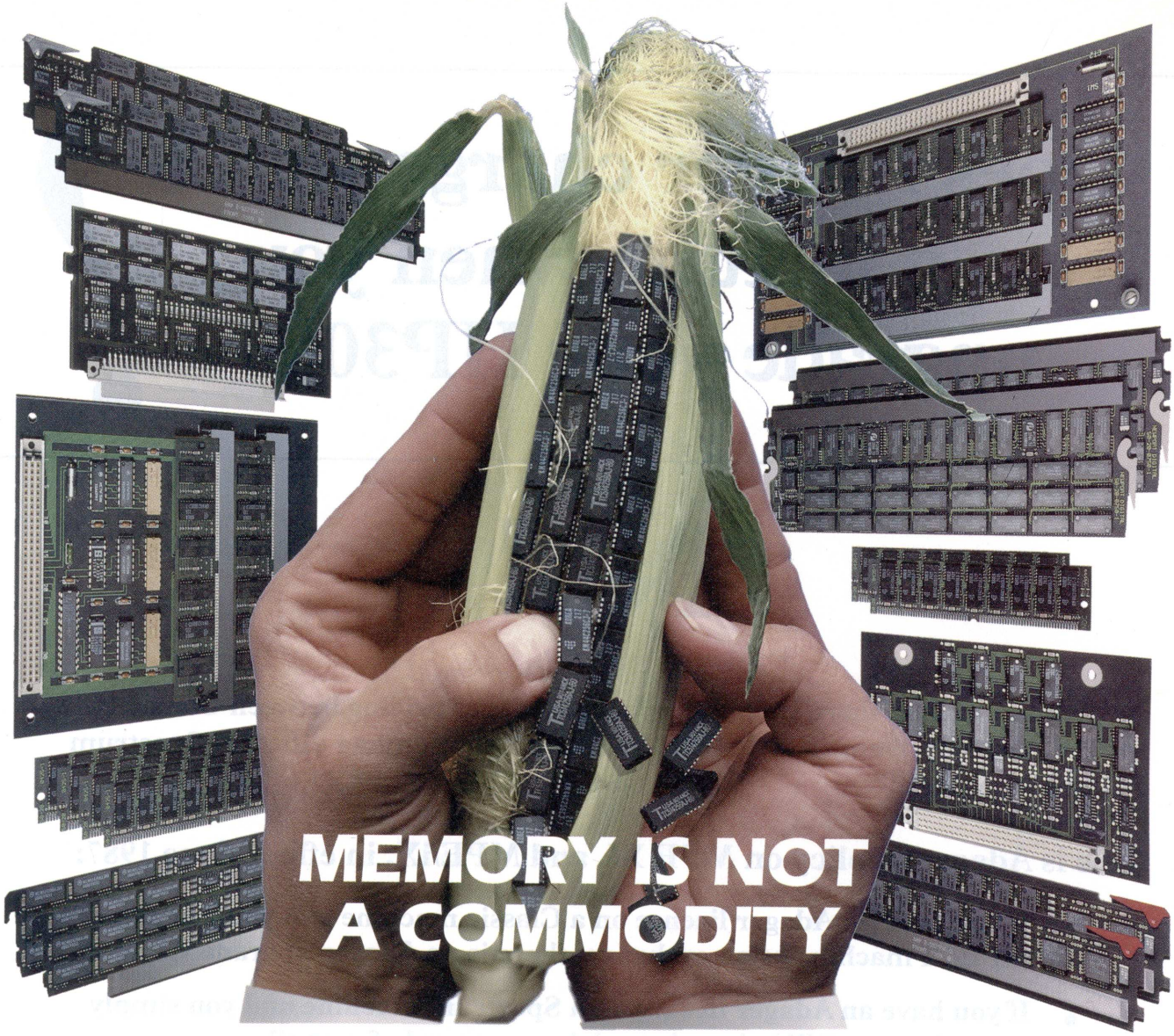
According to Archibald, the term — mass storage — in the former Mass Storage Group, was outdated and didn't fit well with the information revolution. "Sometimes we get into data overload, when information is what's really at the core of it."

Also at the core of it is more than $1.5 billion in revenues that the ISG is expected to add to HP's revenue in 1994. By HP's own numbers, its information storage business (which includes disk drives, disk arrays, optical drives and tape libraries) is growing four times faster than the rest of the information storage business.

## STORAGE WORKS FOR DEC TOO

Not be outdone, the same week that HP announced its new branding strategy and new storage products, DEC announced that its disk, tape and optical storage products are now available for HP 9000 Series 700s and 800s and IBM RS/6000s, as well as Intel-based Windows NT (3.1 or 3.5) platforms.

Like the HP's SureStore campaign, DEC's StorageWorks products are intended to be a reseller-driven solution.




DRAMs are traded like soybeans, pork bellies and crude oil. The market is volatile. Prices change daily.

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| HP-382 | | | | ● | ● | | ● | | | | |
| HP-400/425/433 | | | | ● | ● | | ● | ● | | | |
| HP-425E | | | | ● | ● | | ● | | | | |
| HP-700RX | | ● | ● | ● | ● | | | | | | |
| HP-705/710 | | | | | ● | | ● | ● | | | |
| HP-715/725 | | | | ● | ● | | ● | ● | ● | | |
| HP-720/730/735 | | | | | | | ● | ● | ● | ● | |
| HP-742/745/747 | | | | ● | ● | | ● | ● | ● | | |
| HP-750/755 | | | | | | | ● | ● | ● | ● | ● |
| HP-8X7/9X7 | | | | | | | ● | ● | ● | ● | ● |
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# Does Adager charge you a fortune when you upgrade your HP3000 ?

# No!

**As a matter of fact, there is *no* difference in Adager pricing between Classic (CISC, MPE V) and Spectrum (RISC, MPE XL, MPE/iX) or among different Spectrum HP3000 machines.**

**This is Adager's policy on MPE XL and MPE/iX, in effect since 1987:**

- **If you have an Adager license on a Classic machine and you just get an MPE/iX machine as an exchange, there is no Adager upgrade fee at all.**
- **If you have an Adager license on a Spectrum machine and you simply upgrade your CPU, there is no Adager upgrade fee at all.**
- **If you have an Adager license on a Classic machine and you get an additional computer that happens to be an MPE/iX machine, you simply pay the Adager fee for the additional machine.**

**Bonus: As part of your annual maintenance, you get an ever-increasing selection of Adager functions in native mode on RISC machines.**

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**The Adapter/Manager for IMAGE/SQL Databases**

CIRCLE 104 ON READER CARD

**With a three-tier architecture, you can take that logic, isolate it and build it as an independent program separate from the computer that holds the database.**

"One of the great things we did, was take away any restrictions to become a reseller. There's no test, no special programs," says Susan George, DEC's StorageWorks marketing manager for HP platforms. This is the first in series of announcements of subsystems for HP 9000 Series 700 and 800 systems, says George.

"We have a full complement of HP equipment in our labs," says George. "There's not a Digital system in sight. The engineers get down inside and beat on the equipment so that it works without fail. It's not something that the customer has to burn in on-site." The products offer a complete consistency across HP 9000 Series 700 and 800 hardware and are fully compatible with HP-UX versions 9.04 and 9.05, according to George. Available exclusively from VARs and distributors, StorageWorks prices for HP, IBM and Windows NT environments begin at $1,500.

## ANYONE SEEN THE THIRD TIER?

During October's UNIX Expo in New York City, representatives from the Gartner Group, HP, Magna Software, Transarc, Novell, DEC, IBM and Tandem gathered to promote the benefits of not one-, not two-, but three-tier client-server architectures. Hosted by Kent Lawson president of Magna Software, the panel attempted to explain three-tier technology to a roomful of industry journalists and analysts.

According to seminar panelist Ross Altman, product manager for Magna, two-tier client-server architectures don't serve transactional systems very well. "Distinct [application] modules with clean and clearly defined layers between them are the inherent advantages of a three-tier architecture," says Altman. "The sever domain logic implemented within most database products locks you in to that database vendor. With a three-tier architecture, you can take that logic, isolate it and build it as an independent program separate from the computer that holds the database." Magna offers Magna X software which generates code for application servers that work with client-server transaction monitors like Novell's Tuxedo and Transarc's Encina.

But it's not a question of three-tier being better than two, according to David Scott, HP's representative on the panel. "Another way to look at it," says Scott, software product line manager, "is the the difference between being a cost-driven business [two-tier] and re-engineering the enterprise to increase your competitive advantage [three-tier]." HP, of course, is one of the primary promoters of the OSF's Distributed Computing Environment. HP's DCE/9000 works with HP ENCINA/9000 and HP CICS/9000 transaction monitors in distributed OLTP environments.

## I WANT MY CD NOW

Say goodbye and good riddance to HP-UX software distributed on DAT. Say hello to HP-UX software-laden CD-ROMs. On November 1, HP reduced its CD-ROM drive prices by 20 percent to 30 percent and reduced its CD-ROM media prices by up to 17 percent.

It's HP's way of moving to CD-ROM as its software distribution medium. The program is called CD Now. But don't be misled: It's going to be a three-year process. Overall migration to CD-ROM for the HP 9000, including support updates, is expected to be completed by November 1997. The CD-ROM media price for HP-UX 9.04 and associated software products for the HP 9000 Series 800 will be reduced from $630 to $520. The price for the HP 9000 Series 700 HP-UX 9.0 documentation on CD-ROM will be reduced from $835 to $695.

An internal CD-ROM drive will cost $655 while external drives are now $875. HP also is simultaneously increasing the price of selected DAT and paper documentation by 10 percent to 20 percent.

## AND THE SURVEY SAYS....

"HP had the highest customer satisfaction index" in J.D. Power and Associates' 1994 Desktop PC Customer Satisfaction Study. With a score of 124, HP just beat out DEC, its PC rival, with a score of 115. Traditional PC makers fared less well with Compaq (109), Dell (103), Gateway (102) and Apple (100) behind the leaders while IBM and AST fell below the industry average of 100.

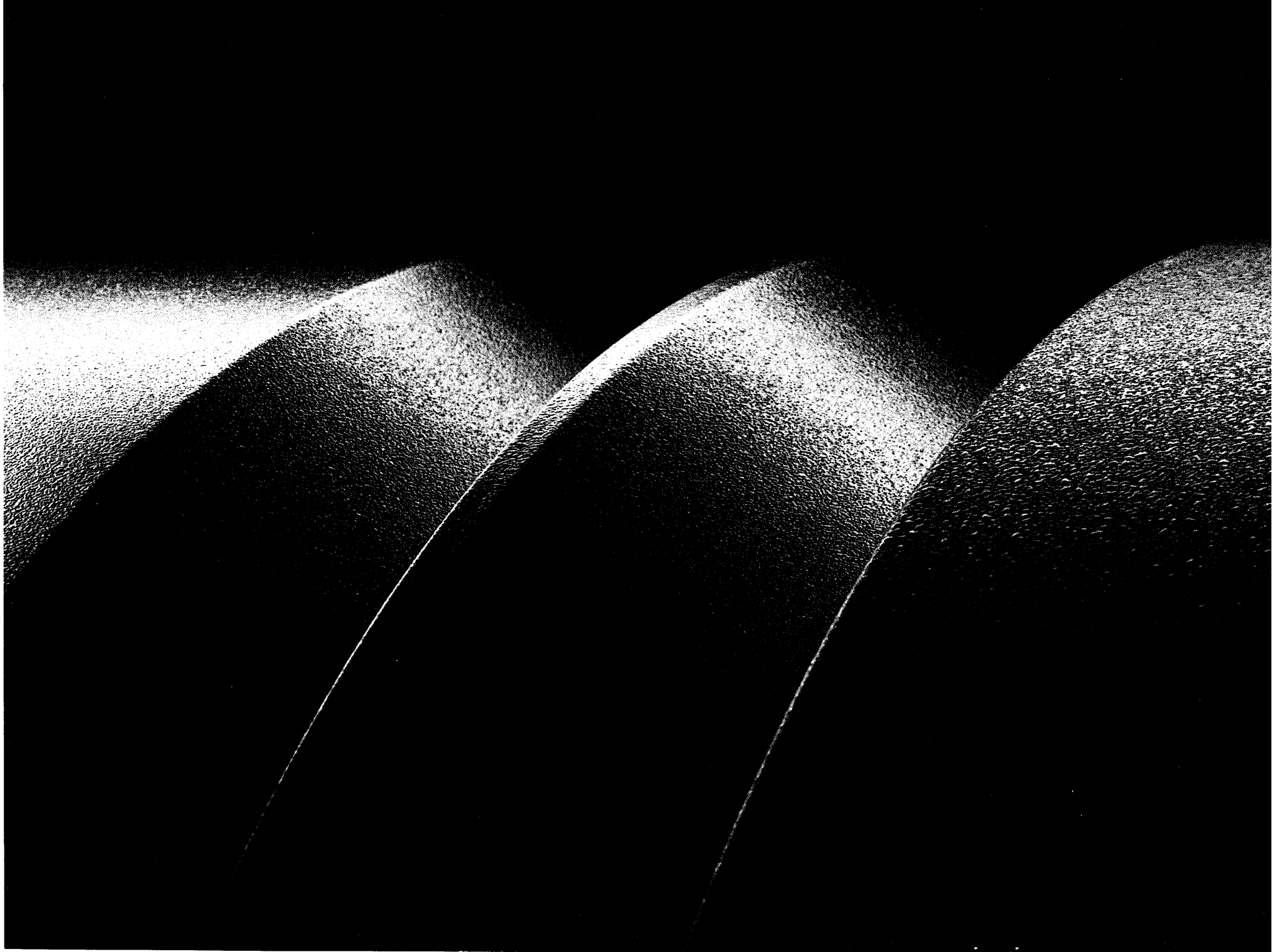
Of the seven criteria that comprised customer satisfaction (reliability, price/value, setup/configuration, technical fit, ease-of-use, user support and OS compatibility), HP scored "particularly well in reliability and price/value," according to J.D. Powers. While product reliability has always been a HP hallmark, the high score for the price/value of its PCs should convince any skeptics that HP is now a serious player in the PC market.

Interestingly, the J.D. Powers press release also noted that reliability was the most critical driver of customer satisfaction in 1994 compared with user support and ease-of-use in their 1993 and 1992 surveys, respectively. The study was conducted among 1,528 users at office-based businesses.

## JUST SAY PC CARD

It figures. You finally learned that the PCMCIA in PCMCIA Cards is the acronumbing acronym that stands for the Personal Computer Memory Card International Association. And now, they officially change the name to PC card. Portable computing just won't be the same.

*Thompson's Internet address: thompson@cardinal.com*

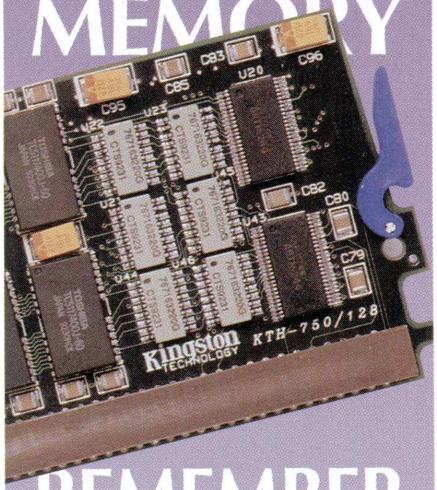


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# *Inevitable Obsolescence*

I am getting tired of reading about pricing ... (:-)

I just read Gordon McLachlan's "And Another Thing" from the October 1994 issue... the computing industry is changing and they do not know where they are going.

Here are some short comments:

In the 1980s, it was a big deal in our company to go to some standards. Standard language, network, operating system, etc, etc. There were indications there was only going to be one operating system, blah, blah.... At least, that is what they were trying to convince us. They are still defining the standard — which is one of those moving targets.

So today, we have more popular operating systems to choose from, more network options than back then, more languages. None of them the panacea for the world. And, guess what, the standards that the standards committees were pushing aren't even mentioned nowadays.

Do we spend more time changing tools rather than improving the process?

About the time the user world of a particular product gets big enough to apply pressure, have enough knowledge base, etc., etc., the product gets obsoleted by the manufacturer by a *better* product. (Forced obsolescence?)

What is a legacy system?

ANYTHING THAT YOU ARE NOT CURRENTLY DEVELOPING!

Thursday's new app is Friday's legacy system because there is something new and better to replace it.

Ah the joys of job security!

*Elbert*

## ALL ABOUT STANDARDS

I read George A. Thompson's Standards column in the September 1994 issue. It was very interesting and I have ticked the reply paid card for more articles along the same lines. I have not been involved in this sort of technical stuff for a while, and it has made me realize how much has gone on in a short space of time. If you have any more detailed information, I would appreciate seeing it. An area of standards that does interest me is EDI. This may be outside your remit but if not again I would be interested in information.

*John M. Howitt*
*Business Development Manager*
*Nike Consultants Ltd.*

*Thanks for your response to our new column. EDI standards are certainly a topic we will explore in the future.*

*Until then, we trust that our August 1994 feature* EDI Graduates to the Intenet *by Trevor Richards, helped inform you about some of the most recent issues.—GAT*

*HP Professional welcomes comments from its readers. Letters may be edited for brevity and clarity, and should be addressed to: HP Professional, 1300 Virginia Dr., Ste. 400, Fort Washington, PA 19034. Fax number: (215) 643-4827. Internet address for staff listed on the masthead:*
*LASTNAME @ CARDINAL. COM*
*Please include a phone number for verification.*

## 270MB UNIT IS AVAILABLE FOR HP9153 REPLACEMENT

ISA announced the addition of a new 270 MB unit to its family of HP9153 replacement Hard Drives with Floppy. ISA has been supplying 46MB and 118 MB units in the market for more than 10 years, and this release would give more choice to the users. Price is $2,220.00. Contact Floppy Disk Family Dept. 713/493-9925. **CIRCLE 403 ON READER CARD**

## ISA NEW POWER MANAGEMENT SOLUTIONS

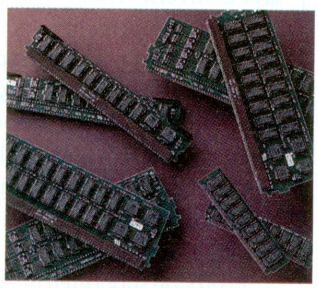
ISA and Mitsubishi Electric developed a new intelligent UPS (Uninterruptible Power Supply) system combined with ISA's well-known Model 7020, or 7030 Auto Shut-Down unit. The system features: Simplified shutdown process initiation, Timer operation, Network, Remote Control, Digital and analog sensor inputs. Multi-Platform support (HP, Sun, IBM, DEC, SGI, etc.) 1, 2, 3KVA models are available. **CIRCLE 404 ON READER CARD**





## MEMORY BOARDS AND VIDEO RAM AVAILABLE FOR HP712

ISA introduced memory cards and video RAM cards for HP712. The memory cards are available in 64MB and 32MB capacities. For pricing, contact Texas ISA, Inc., 713/493-9925. **CIRCLE 401 ON READER CARD**



## MULTIFUNCTION 4MM SUB-SYSTEM

Texas ISA, Inc. introduced a new 32GB Multifunction 4MM Sub-System at Interex '94 in Denver, Colorado. Two models are available: 5032S-Dual for DDS-I and 5034S-Dual for DDS-II. The unit features: off-line tape-to-tape copy, verify, mirroring, cascading, and alternating drives. Supports HP, SUN, IBM and DEC. Contact John Larmie; 713/493-5746. **CIRCLE 402 ON READER CARD**




HP9122C HP9153C Replacements

# ISA Floppy Disk Family



**ISA 1015**
(HP9122C Compatible)
3.5 inch dual
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**ISA 1060**
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HP-IB SS/80

**ISA 1015S** *(NEW SCSI)*
3.5 inch
single
(HP internal FD compatible)
SCSI-for HP9000 300/400/700/800

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SCSI-for HP9000 300/400/700/800

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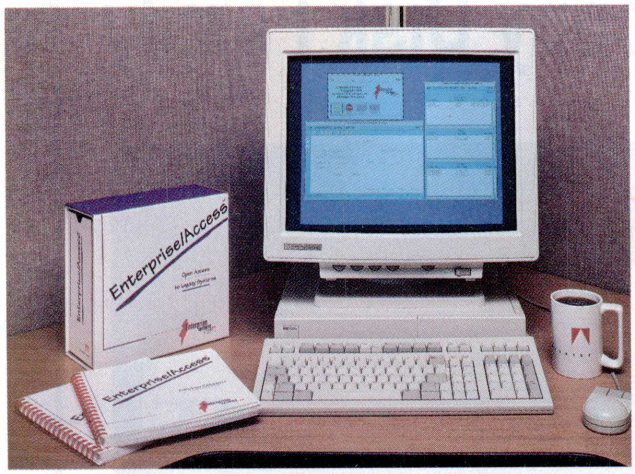
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CIRCLE 245 ON READER CARD

# Enterprise/Access Spans The Generation Gap




**ENTERPRISE/ACCESS**

- Developers can program with Enterprise/Access' ObjectScript, C or C++
- Support for HP 9000, Sun SPARC and Pyramid MIS
- Prices range from $30,000 to $240,000

**Apertus Technologies**

Enterprise Systems Group
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Eden Prairie, MN 55344
tel: (612) 828-0300
fax: (612) 828-0773

CIRCLE 353 ON READER CARD

Many companies still need to mix the new without tossing out the old. Enter Enterprise/Access from Apertus Technologies (Eden Prairie, Minn.), a server-based development toolkit that encapsulates legacy applications and data for access by client-server applications. These applications read and write to legacy systems through stored procedure calls, sending requests for services to Enterprise/Access, which handles the communications side. Developers can program with any of three languages: Enterprise/Access' ObjectScript, C or C++.

"There's no software that goes up on the mainframe," notes Apertus' Lizabeth Converse Wilson, general manager of the Enterprise Systems Group.

Version 2.1, will add new platform support — AT&T and IBM RS/6000 — to existing platforms (HP 9000, Sun SPARC and Pyramid MIS). Clients supported include UNIX, Windows and OS/2. With its Open Server Gateway, Enterprise/Access gives a common interface to ODBC, Microsoft/Sybase SQL Server and compatible clients.

Enterprise/Access is positioned for large, OLTP applications, with user communities from 100 to 10,000. The majority of Apertus' customers are using HP 9000s.

Pacific Bell (San Ramone, Calif.), the product's largest user, uses it as a generic platform to get legacy access. There are two core applications. One is for their network management centers — now at 2,000 users, going up to 10,000 year end.

The second application, an expert system-based workflow automation, does billing reconciliation. Four legacy systems had to be accessed. "Enterprise/Access gave us the ability to do it in a more consistent and easy way," says Rebecca Barfknecht, director of Customer Care Applications at Pacific Bell.

Previously, a service rep had to go into five different legacy systems to get certain information. Now the rep makes one request across a WAN. With Enterprise/Access sitting as a front end to the legacy system, those five transactions get kicked off concurrently. It also attempts to streamline the laborious process of "screen-scraping" (counting rows and columns to manage screen data) by storing designated data fields in a resource database.

"One of the things we found, is there's a lot of hidden cost to client-server development, primarily in how you maintain it," says Converse Wilson. If Pacific Bell had a problem or bug, it was difficult to isolate where the problem was occurring among the distributed code. In response, Apertus built in a graphical System Monitor that allows centralized configuration, performance and fault management.

Protocols supported included: 3270/SNA, 3270/BSC, LU6.2, TCP/IP, Telnet and SYBASE Open Server interface. An HP 3000 MPE interface is scheduled for the first half of 1995.

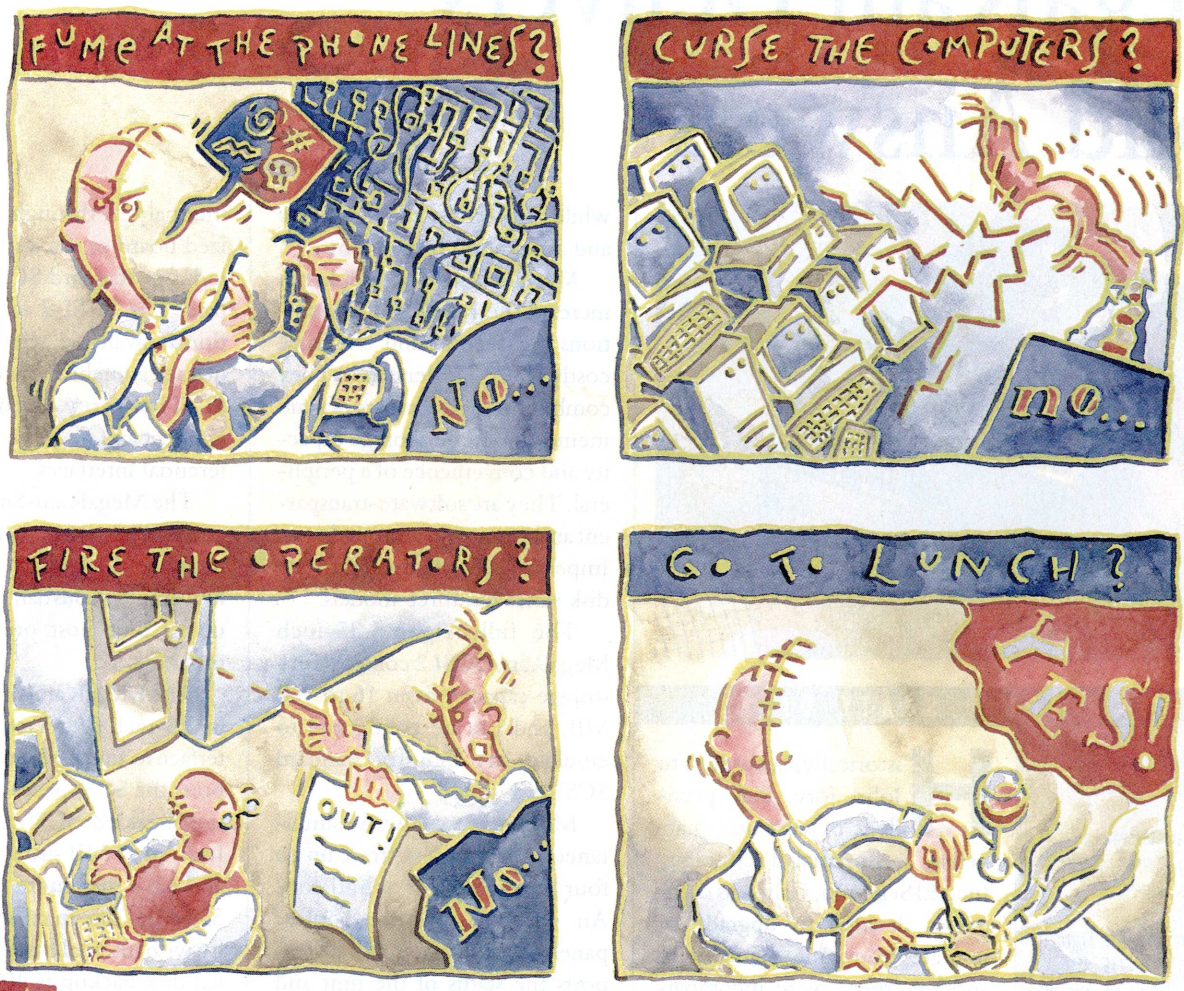
The product requires the HP 9000 Models 807-897, F10-I50, G60-I70, 80S/100-400 or T500. You need UNIX 4.1.x or higher, Sybase 4.6 or Informix 5.0; an X11R5-compatible window manager; and optionally, Sybase Open Server and Open Client to use the Open Server Gateway features.

Enterprise/Access comes in four separate pieces: a development system, production system, client libraries and Open Server Gateway. Total costs range from $30,00 to $240,000.

*—Jim Esch, Contributor*

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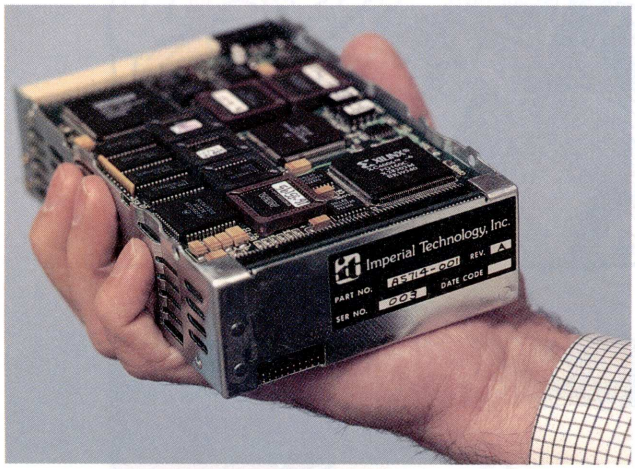
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**CIRCLE 355 ON READER CARD**

Historically, according to John Jory, vice president of sales and marketing at Imperial Technology Inc. (El Segundo, Calif.), as companies decided to upgrade or migrate from one platform to another, there were incompatibilities with the newer systems. "There were millions of dollars in application code and these companies couldn't take the chance of rewriting the code in the hopes that no glitches would occur," says Jory. Imperial allows corporations to put hot files — operating system files, database indices and journal files — on MegaRam solid-state disks while less active data can stay on magnetic disk, tape or optical media. This provides a way to maximize system performance while protecting the hardware and application investment.

MegaRam solid-state disks can increase the number of transactions per second and eliminate costly I/O bottlenecks. They combine the performance of main memory with the storage capacity and convenience of a peripheral. They are software-transparent and require no custom drives. Imperial's MegaRam solid-state disk series has three models.

The full-height 5.25-inch MegaRam-SCSI 2 comes with a storage capacity from 16 to 960 MB, and can be configured to emulate any industry standard SCSI disk drive.

Multiporting allows for simultaneous data access from up to four host processors or initiators. An optional operator control panel (OCP) monitors and reports the status of the unit and allows the operator to change the SCSI device number, run diagnostic tests, check and clear error registers, start battery test, and initiate backups and restores. It also features: built-in error detection and correction, and multiple LUNS.

The MegaRam-Supra has an eight-inch chassis and a capacity that can be expanded from 67 MB to 3 GB by adding storage modules. Two MegaRam-Supras can mount side by side in a 19-inch rack.

Host computers can be connected directly to the MegaRam internal bus through a customized board or via a multiported industry standard SCSI-2 interface. The SCSI-2 implementation is available with synchronous or asynchronous operation, SCSI bus parity, disconnect/reconnect and single ended or differential interfaces.

The MegaRam-Supra can be configured with four SCSI-2 interface controllers which allow simultaneous data access from up to four host processors or initiators.

The MegaRam-35, available in 3.5-inch form factor, will interface to any computer that supports the SCSI protocol. It has a single-ended SCSI-2 interface. It uses 134 MB storage modules and has a maximum capacity of 536 MB. The maximum capacity with internal battery or internal disk backup is 402 MB and 268 MB, respectively.

All of the models have a mean time between failure rate of over 1.5 million hours, a data transfer rate of 10 MBps (sync) and 5 MBps (async), and a maximum access time of .035 ms. A Fast/Wide SCSI version is expected to be available in January 1995.

The models support DEC, Data General, Sun, HP, IBM, Silicon Graphics, and all SMD or SCSI supporting computers. Price is $100 per megabyte.

*—Deborah Schwartz, Assistant Editor*

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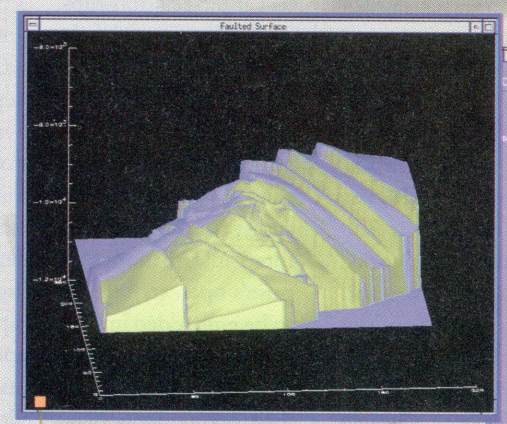
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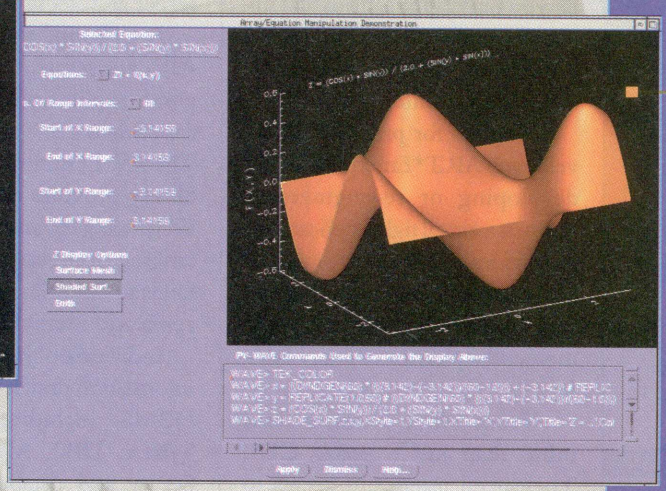
The tremendous success of the PA-RISC architecture has catapulted HP into the leading position for graphics workstations and multi-processing servers. With a product family that meets your high-performance computing needs, HP has been rated the number one commercial RISC/UNIX vendor[1] in the world, and the number one technical workstation vendor.[2]

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1. Aberdeen Group, February 1994
2. International Data Corporation, January 1994




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# ART*Enterprise Builds Professional Objects




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- Development licenses cost $7,995, maintenance and support programs range from $1,600 to $2,400

**Inference Corp.**

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fax: (310) 322-3242

**CIRCLE 351 ON READER CARD**

Inference Corp.'s (El Segundo, Calif.) ART*Enterprise lets you build applications that integrate databases, documents and policies in an object-oriented, rule-based architecture.

Designed for professional developers, ART*Enterprise is for developing or re-engineering business-critical tight applications. It provides rapid prototyping, object modeling and reuse, repository-based cooperative development and sophisticated logic building.

"Front office workers need more than just a pretty GUI. They need intelligent access to documents, in addition to conventional business data stored in structured databases," says Chuck Williams, Inference executive vice president and chief technical officer.

Objects representing natural business entities need to be constructed integrating information from corporate databases and documents, adding methods to implement operations and model behaviors, and adding rules to perform analysis and support decision making.

ART*Enterprise features include: an object-oriented programming (OOP) language; a dynamic GUI class library; a database class library; a business rule language and processing engine; Inference's case-based retrieval (CBR) technology for accessing unstructured information; a dynamic development environment; and a three-layer client-server architecture.

ARTScript, the OOP part of ART*Enterprise, can perform rapid application development easier than C++ and SmallTalk. The ART*Enterprise GUI class library provides more than 200 GUI widgets and frameworks, ranging from simple buttons and fields to complete multiwindow application templates.

Individual objects can integrate information drawn from multiple DBMSs including ORACLE, Sybase, DB2, Microsoft SQL Server and databases accessible through the Q+E libraries.

ART*Enterprise rules are independent statements that express business policies or decision-making principles. It automatically selects and applies all relevant rules in each user session.

CBR technology lets users describe business objects with free text and structured fields on forms. All databases and documents that contain information about the objects of interest are automatically searched to identify those objects which best match the specifications. The resulting objects are retrieved and can be browsed or automatically analyzed by rules.

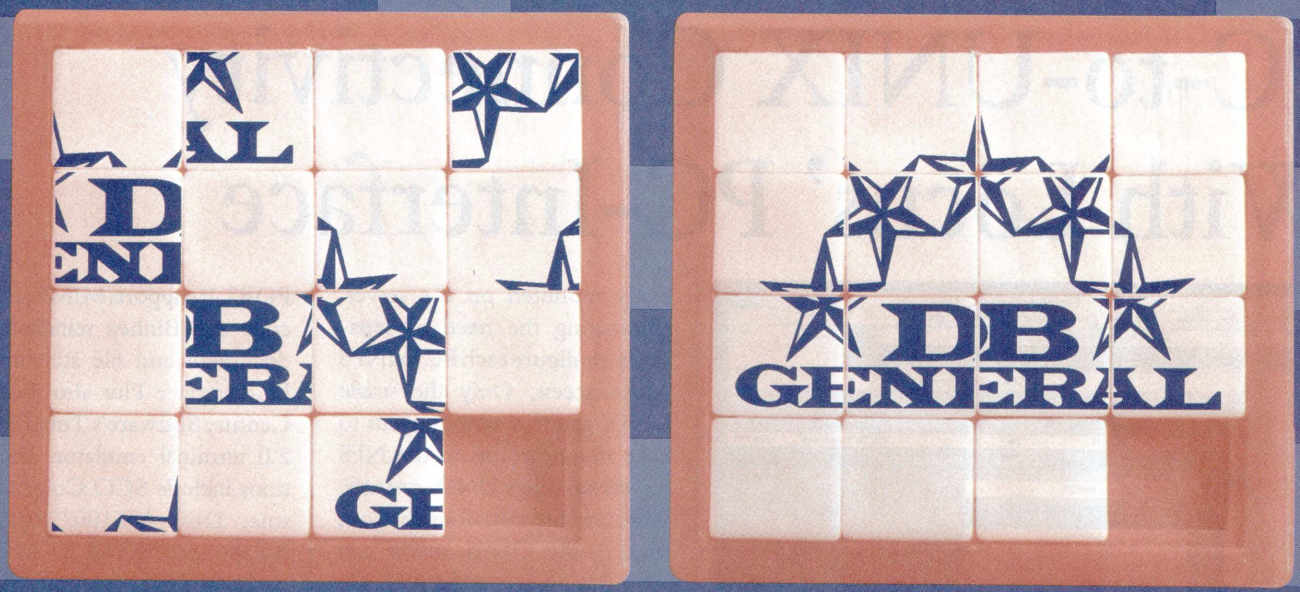
ART*Enterprise provides a development environment with a combination of point-and-click visual design tools and code generators, interactive debugging and visual representations of object inter-relationships.

Applications developed with ART*Enterprise consist of: a GUI layer, a model layer for representing business entities and integrating business policies through rules, and a data view layer offering access to structured and unstructured information. ART*Enterprise's open architecture allows it to be embedded in external applications or be the central application that calls other applications. The components may reside on the client, server or host.

ART*Enterprise is available for Windows or OS/2. HP-UX support is scheduled for 1995. Development licenses cost $7,995. Maintenance and support programs range in price from $1,600 to $2,400.

*—John P. Burke, HP 3000 Editor*

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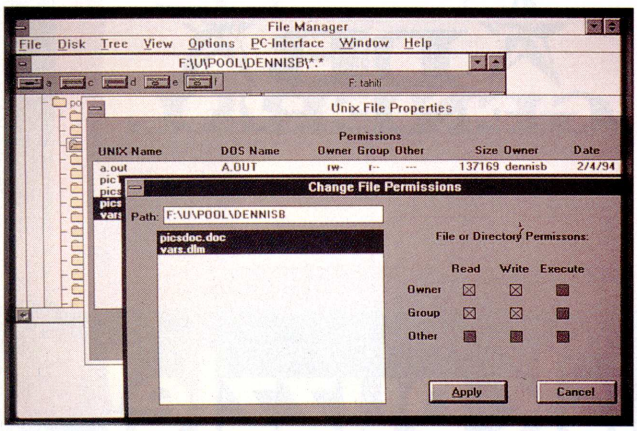
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PC-Interface is a PC-to-UNIX connectivity solution that provides gateway access to enterprise services on UNIX servers. According to Dennis Bordelon, PC-Interface product marketing manager, PC-Interface products are "extremely attractive alternatives to commonly used NFS-based connectivity products based on feature set, ease-of-use, reduced network administration and low entry-level pricing."

The latest PC-Interface clients for Windows and DOS PCs, PC-Interface 5.0 and PC-Interface Plus 2.0, include support for: NFS-mounted volumes on UNIX servers; AFS and DFS/DCE file systems; file and print sharing; TCP/IP; SNMP and MIB-3; and NetWare and Windows for Workgroups co-existence.

PC-Interface users can immediately access NFS files already mounted on the server, eliminating the need to separately configure each PC for NFS server access. Only the single UNIX gateway system needs to have mount points to the NFS servers on other UNIX systems. With a transparent login/logout feature, the UNIX server can even mount a specific NFS file system for the user at login and unmount it at logout.

With PC-Interface, users can access files on UNIX servers that support AFS and DFS hosts, with no need to learn the file system, through the Kerberos authentication scheme. Network security also is improved through the Kerberos encryption method that authenticates NFS, AFS and DFS users, and other resources on a distributed network.

PC-Interface Plus provides a Windows implementation of the industry standard ftp. Desktop users can transfer files and directories from any computer on the enterprise network, or the Internet, supporting an ftp server. The user simply drags and drops; there is no need to memorize complex file names or input esoteric commands.

For local workgroup E-mail and gateway access to enterprise-wide and Internet E-mail, PC-Interface Plus includes Qualcomm's Eudora. Eudora provides a Windows-oriented interface to users, and connects to standard UNIX facilities via SMTP and POP3. It supports MIME, uuencode and Binhex standards for document and file attachment. PC-Interface Plus also includes Century Software's TinyTERM 2.0 terminal emulator. Emulations include SCO Color Console, DEC VT100/220/320, AT386, and WYSE 50 and 60.

PC-Interface supports third-party applications requiring TCP/IP transport through the use of the Novell Workplace for DOS TCP/IP stack and WINSOCK.DLL. No additional TCP/IP package is required. The TCP/IP stack enables the integration of existing PC LANs with UNIX.

The PC-Interface server supports many UNIX platforms, including HP-UX 9.0, SCO, AIX, Solaris, and UnixWare. According to Bordelon, "The driving force behind the port of PC-Interface to these platforms is the corporate downsizing trend and the emergence of the enterprise networking arena."

Transarc Corp. chose PC-Interface as its PC-to-AFS enterprise-wide solution and offers it with the commercial version of their AFS distributed file system. Transarc's AFS installations are largely SunOS, AIX and HP-UX users.

The PC-Interface server costs $255. The PC-Interface 5.0 client software costs $279 and the PC-Interface Plus 2.0 costs $449.

*—John P. Burke, HP 3000 Editor*

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# Visualize Data On The Desktop

## Visual Numerics Inc. Provides Data Analysis On UNIX Workstations



"Visualization plays well into [the financial marketplace] because you usually have large amounts of data that change rapidly. With visualization, you can continue to monitor changes over time to see how an investment instrument is doing."

Don Kainer
Vice President/
General Manager
Visual Numerics Inc.

**Visual Numerics Inc.**
6230 Lookout Rd.
Boulder, CO 80301
tel: (303) 581-3403
fax: (303) 530-9329
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Vic Pizzo, a visiting scientist at the National Oceanographic and Atmospheric Administration's Space Environment Lab (Boulder, Colo.), studies the solar wind. He also monitors sun spots.

To understand such phenomena, and if possible, to predict them, Pizzo analyzes data received from spacecraft, and does numerical simulations on a super computer. He then takes sets of data and visualizes it on a HP 9000 Model 710 workstation using PV-Wave Advantage, the visual data analysis software product from Visual Numerics Inc. (Boulder, Colo.).

Predicting a major solar flare is difficult, he says. "Depending on what spacecraft are currently looking at the sun and what kind of instrumentation they have on board, you may have a day or two warning. But usually you have to infer that something has happened on the sun."

Compared to PV-Wave, Pizzo says, the mainframe-based techniques he once used to map the physical quantities he studies were relatively crude. "You'd have to do enormous sets of two-dimensional, contour-like line plots. With PV-Wave you can build maps in three dimensions so that even subtle variations can be seen."

In addition, Pizzo says, without visual data analysis, calculations had to be done in batch mode. Any change would require a new program. "Looking at the data can give you new ideas," he says."Now, with a few keystrokes you can change the input and view the data in a different way."

According to Don Kainer, vice president and general manager at Visual Numerics, Pizzo's use of visual data analysis reflects the general trend of moving off the mainframe and on to the desktop. Consequently, products like PV-Wave have become more accessible to users outside the scientific and technical communities.

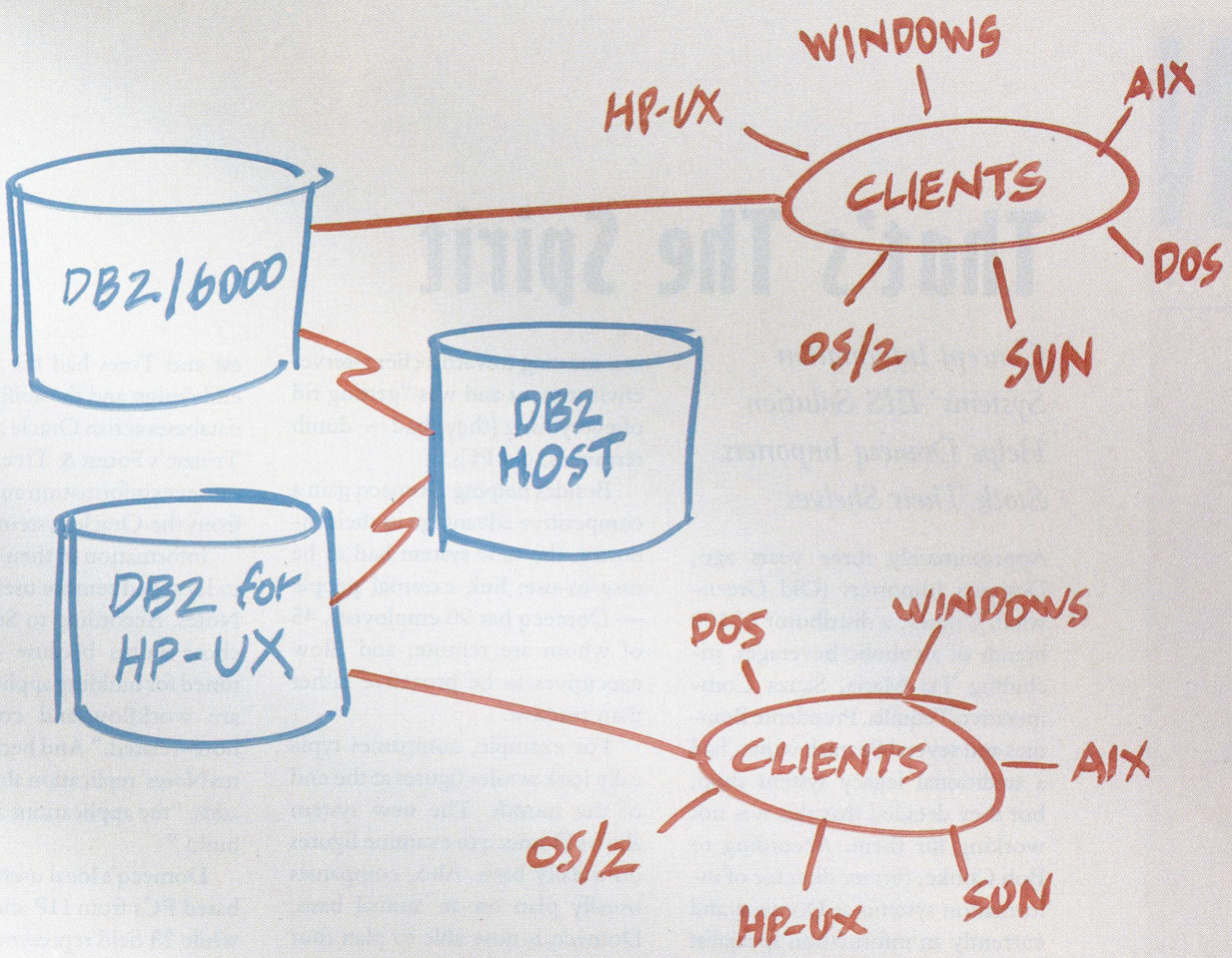
The original PV-Wave was developed by Precision Visuals Inc. (Boulder, Colo.) for DEC VAX and ported to UNIX in 1988. The 1993 merger of Precision Visuals with IMSL (Houston, Texas), a developer of FORTRAN subroutine libraries used to build statistical analysis applications, led to Visual Numerics and an enhanced PV-Wave Advantage. Today, Visual Numerics is seeing an annual 15 percent growth in sales on UNIX platforms, and of these the fastest growing sales are for the HP 9000. "Last year, HP was our highest growth platform, and it's following that trend this year as well," Kainer says.

Kainer sees a basic synergy between his company and HP. "One of our major markets is the test and measurement market — engineers gathering and analyzing data. A lot of their measuring equipment comes from HP," he says. "Now, as HP leverages that market into workstation sales it means potential sales of our visualization products too."

But in spite of Visual Numerics' sci-tech heritage, data visualization is no longer confined to engineering applications. "The financial marketplace is a hot market for us now," Kainer says. "Visualization plays well into this because you usually have large amounts of data that change rapidly. You couldn't keep up with the changes if you had to analyze every number. With visualization you can continue to monitor changes over time to see how an investment instrument is doing." Medical data imaging is another area in which Kainer expects high growth.

But the most notable change in the market, according to Kainer, has been the increase in new users, due to hardware advances. "As the hardware vendors have climbed the ladder in terms of price/performance they've made visualization a technique that is available to more people than in the past, when a high-performance, and high-priced, box was required."

*—Sam Dickey, Contributor*




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# That's The Spirit

*Concept Information Systems' EIS Solution Helps Domecq Importers Stock Their Shelves*

Approximately three years ago, Domecq Importers (Old Greenwich, Conn.), a distributor of 100 brands of alcoholic beverages, including Tia Maria, Sauza Commerativo Tequilla, Presidente Brandies and several Spanish wines, had a traditional legacy system shop, but they decided that this was not working for them. According to Bob Cooke, former director of information systems at Domecq and currently an information specialist at a newly formed consulting firm, "We were convinced that we could get a competitive advantage with the development of an innovative information system."

Cooke spent the first six months educating himself about the beverage industry from a sales and marketing perspective. "We wanted the tech people to be up on the business requirements that drive the products," says Cooke.

Cooke looked at Oracle Consulting and Andersen Consulting, but liked Concept Information Systems (CIS; Stamford, Conn.) because of their methodology. "They were willing to work with us on a RAD technology," Cooke says. So, Cooke and CIS jointly decided on a decision support system (DSS) with executive information systems-like (EIS) capabilities. According to Cooke, Domecq was moving toward a client-server environment and was "getting rid of everything [they] had — dumb terminals, old PCs."

Besides helping Domecq gain a competitive advantage in their industry, the new system had to be easy-to-use; link external people — Domecq has 90 employees, 45 of whom are remote; and allow executives to be proactive rather than reactive.

For example, companies typically look at sales figures at the end of the month. The new system allows Domecq to examine figures on a daily basis. Also, companies usually plan on an annual basis. Domecq is now able to plan four times a year. "This is something a lot of companies can't do because it is simply too difficult to get all of that information and people together in such a short period of time," Cooke says. Sales programs and quotas can be sent in and approved or rejected and then sent back out quickly. "What used to take months, now takes days," adds Cooke.

Basically, the need was to tie together Oracle financials, HP hardware, an HP SuperServer and PCs across a national WAN. According to Mike Seifert, president of CIS, several products were evaluated to find the most appropriate DSS solution. "We were looking to house an entire decision support system on a laptop," says Seifert. "We learned a lot about which products were good in that environment where large databases needed to be accessed remotely."

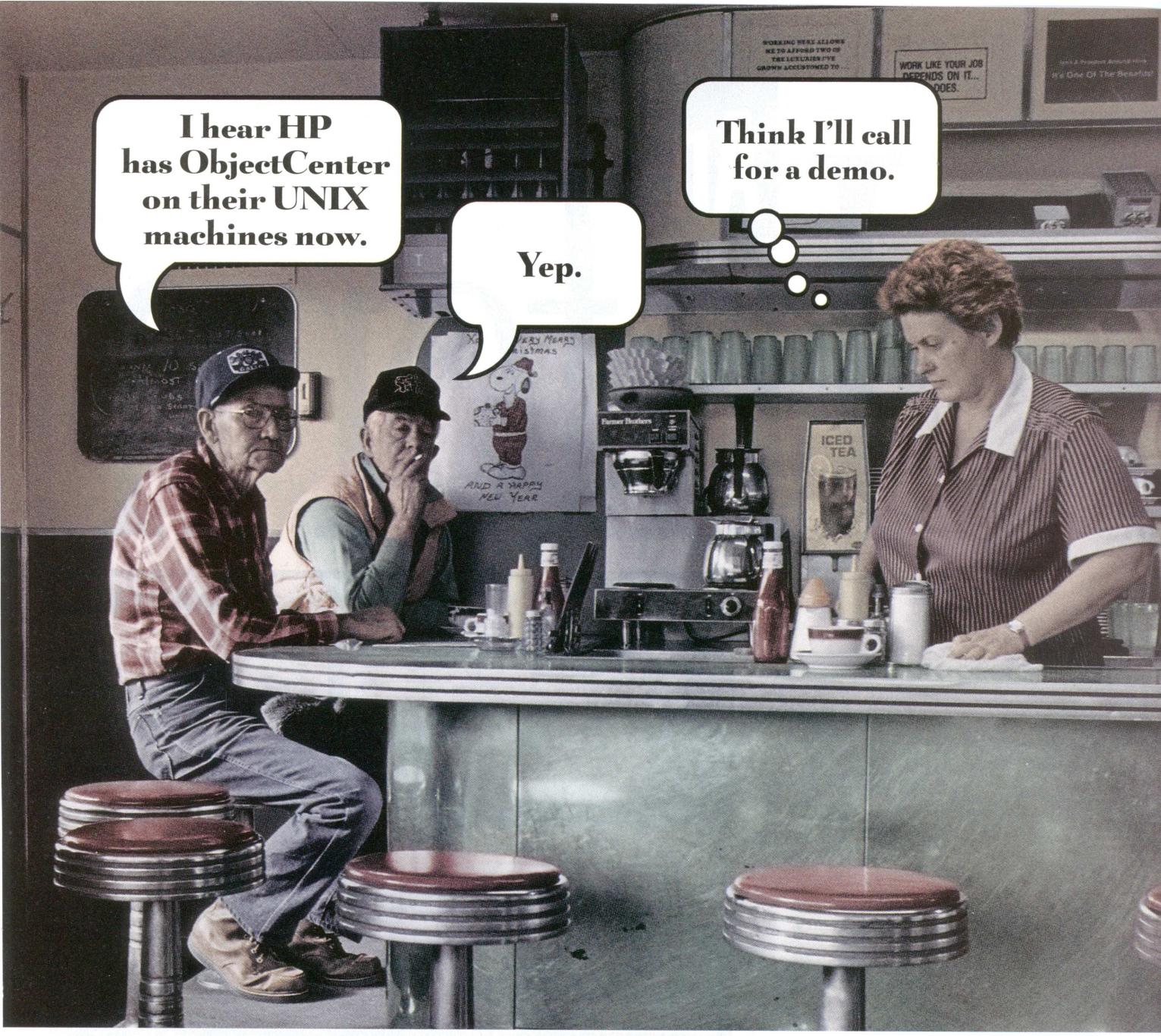
Domecq and CIS chose Visual Basic and Forest & Trees to develop the system. Seifert adds, "Forest and Trees had the best front-end design and the ability to access databases across Oracle and Lotus." Trinzic's Forest & Trees front-end retrieves information automatically from the Oracle system.

Information is then distributed to local and remote users via Lotus Notes. According to Seifert, "We chose Lotus because it is really tuned for building applications that are workflow-and communications-related." And because of Lotus Notes' replication ability, Seifert adds, "the applications are quick to build."

Domecq's local users have 486-based PCs from HP and Compaq, while 25 field representatives have 486-based NEC Versa laptops. Overall, it was a two-phase project. The first phase, which was finished in October 1993, encompassed the DSS, and getting the portables, communication systems, operations and Lotus Notes applications in place. Phase two, which was finished in July 1994, included the implementation of more Lotus Notes applications that covered budget, planning, groupware applications, chain and national accounts.

CIS is located at 271 Summer St., Stamford, Conn. 06905; (203) 363-2060.

*—Deborah Schwartz, Assistant Editor*



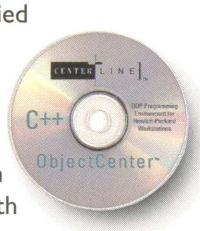

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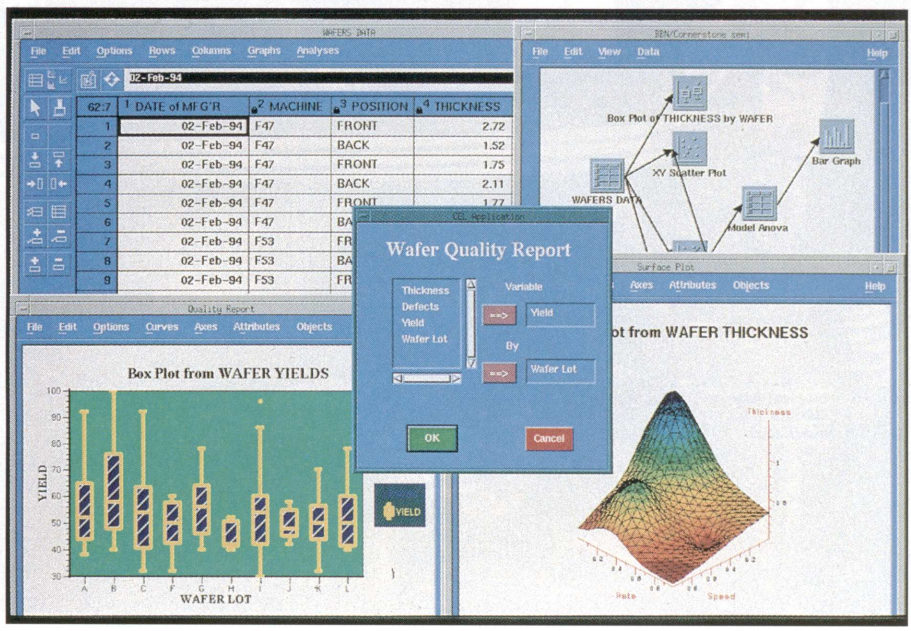
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# An Inform




The rebels in the information revolution hold these truths to be self-evident: life, liberty and the pursuit of better decision support. These revolutionaries are motivated by a passion for information. Facts. Business details. And like their rebel ancestors, they are fighting for independence from a monarchical rule. Only this time, it's a mainframe-derived monarchy.

Their weapons? A wide variety of graphical query and report generators, spreadsheets, visual data analyzers and other so called End User Data Access (EUDA) tools. IDC (Framingham, Mass.) has measured a clear sense of IS commitment: 88 percent of IS managers are emphasizing EUDA tools over the next several years. And when ranked by importance of function, EUDA tools are playing a leading role in the development of client-server technology.

## Trends From Other Dimensions

IMPROVEMENTS IN EUDA TOOLS are being influenced by two emerging trends: the recognition of data warehouses as an important part of decision support systems

# ation Coup

## Armed With EUDA Tools, End Users Fight For Their Right To Data

GEORGE A. THOMPSON

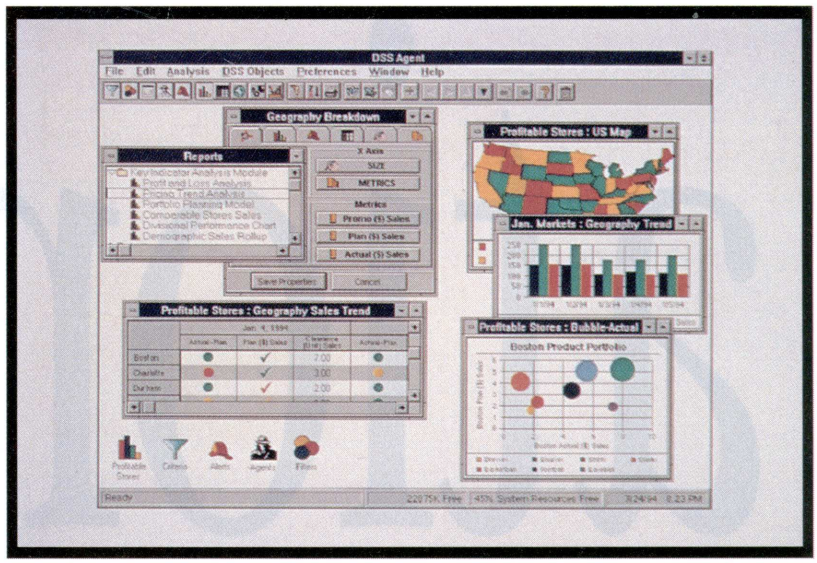
(DSS) and a demand for the querying technology that previously have been provided by multidimensional databases and executive information systems (EIS).

The IS practice of "empowering end users" by providing nothing more than a desktop-based Windows GUI so that they can "mine corporate databases" with "just a simple click of the mouse" has proved relatively useless. And sometimes dangerous. That's why more companies are turning to data warehouses (see *The House That Data Built*, page 36) as an intelligent way to consolidate, organize and store operational data extracted from transactional-oriented databases. "A data warehouse can be used with any type of [IT] architecture. It frees up the production database, so you don't bog it down with user queries," says Brad Hiaga, product manager for Trinzic's (Palo Alto, Calif.) Forest & Trees, SQL-based software for data access and query.

Forest and Trees is used at one HP division to query information from two RDBMSs and a network of 30 TurboIMAGE databases running on an HP 3000. Financial analysts and department managers use it to analyze and track various expenditures against the company's general ledger. But although SQL-compliant EUDA front-end tools like Forest and Trees have made querying RDBMSs and data warehouses less formidable, SQL, with its many dialects, is still too complex and non-

intuitive for non-technical users, and some DSS analysts, to skillfully master. Users still have to know too much about how the physical database is structured. And even successful queries may return incorrect results. What users want and need is ad hoc querying, drill-down and slice-and-dice capabilities usually associated with multidimensional databases.

Like a multidimensional database, Forest and Trees provides users with cross tab views and drill-down capability from 25 different RDBMSs including PC database servers, spreadsheets and mainframe systems. "Multidimensional databases are excellent for financial data and large amounts of time-based data, but their query language is pretty closed," says Hiaga. Proprietary query languages are one of the main limitations of using multidimensional databases. "But with SQL-compliant interfaces, almost any [third-party] front-end tool like ours can be used for query and access," says Hiaga. Forest and Trees also supports an SQL interface to Lotus Notes.




Although providing cross-tab or spreadsheet-style views have been the forte of multidimensional databases, "you don't have to store your data multidimensionally to get a multidimensional view," stresses Steve Trundell, director of Technology for Micro Strategy Inc. (Vienna, Va.). Like Forest and Trees, Mirco Strategy's DSS Agent provides multidimensional views. But DSS Agent also supports denormalized, summarized and partitioned data models — the three characteristics that define a data warehouse.




"With RDBMS servers now capable of providing up to 100 GB of storage, a data warehouse can now be standard part of a company's infrastructure," says Trundell. DSS Agent works with Informix, Oracle, Sybase and Red Brick Systems' Red Brick Warehouse RDBMSs to provide data warehousing services.

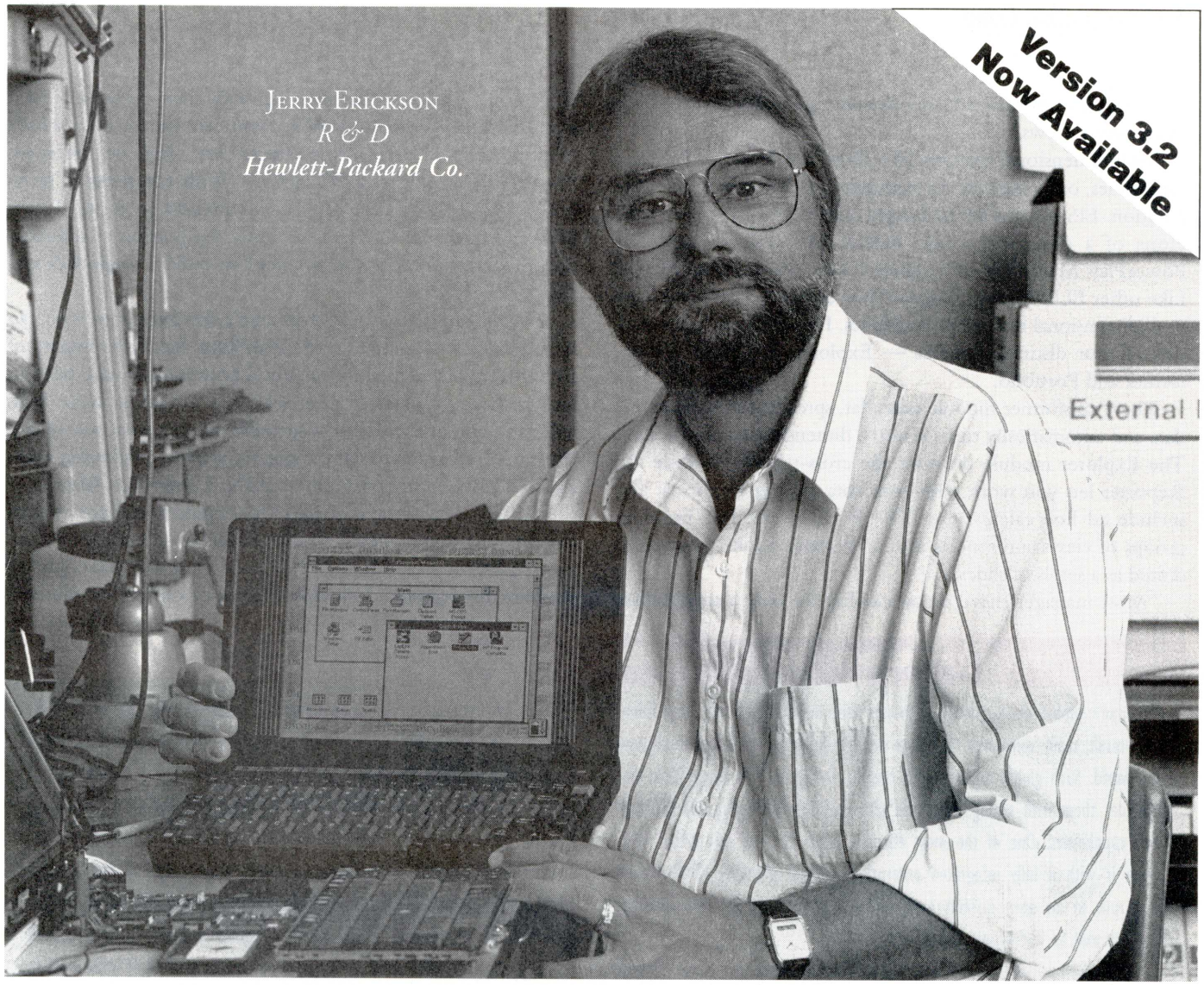
But more importantly, DSS Agent provides a dynamic link to meta data (information about the data in a data warehouse). Trundell describes it as card catalog that tells you what data resides in your data warehouse and where it is located. For example, meta data may contain: data/extraction transformation; column aliases; data warehouse table sizes; data summarization/modeling algorithms; and data usage statistics. DSS Engine tightly integrates meta data and the desktop application. Meta data also is an important issue for IS managers because it provides a measure of security and control over the data warehouse.

"Meta data is a big issue," says Perry Mizota, vice president of marketing for BusinessObjects from Business Objects Inc. (Cupertino, Calif.). BusinessObjects has the ability to grab the meta data that a data extraction tool creates and bring it into BusinessObjects, according to Mizota. "BusinessObjects can also leverage the unique capabilities of the Informix, Oracle, Red Brick and Sybase databases that it connects to."

For example, BusinessObjects can take advantage of Oracle's DECODE statement, an IF-THEN-ELSE type of processing. DSS analysts at Quantum Corp. (Milpitas, Calif.), the worldwide manufacturer of disk drives for PCs and workstations, uses BusinessObjects as a front end to an Oracle-based data warehouse containing financials, order and manufacturing data running on a HP 9000 Business Server for strategic planning purposes.

But the primary advantage of BusinessObjects is shielding end users from the complexities of SQL. By using so-called "business objects," an SQL definition corresponding to its representation in the database, end users deal with terms with which they are familiar like "sales," "customers" or "product." Consequently, says Mizota, "end users need not know about database structures or where the data is located."

But Mizota also points out that customers are now looking for analytical capabilities. "Last year the demand was for the functionality to use the data. Now, they want to generate very complex reports off that data." BusinessObjects' Business-




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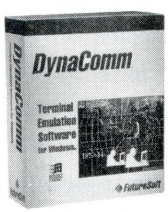
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Analyzer, an optional add-on module, provides cross-tab or matrix-style views.

Multidimensional features like those are bringing EIS-like capabilities, once reserved for managers, to everyone in the corporation. EIS systems are no longer reserved for the upper echelons of a company," says Robin McNeill, director of PowerPlay Marketing of Cognos Corp. (Burlington, Mass.). Like other EUDA tools, Cognos' PowerPlay 4.0 now provides multidimensional reporting capabilities. PowerPlay actually consists of four distinct modules — Explorer, Reporter, Transformer and Portfolio.

The Transformer module takes flat, spreadsheet or relational data and automatically turns it into a dimensionalized structure. The Explorer module provides the cross-tab views while the Reporter lets you work with your data in a report format and include ad hoc calculations. The Portfolio module provides groups of views and reports into a "briefing book" that is presented as a series of slides.

"Most managers have accountability for only a small subset of data in a database that lines up with their accountability," says McNeill. "With PowerPlay, you can extract only what's relevant to you." Because managers are often on the road, PowerPlay can run on a PC laptop. "With compression technology, 30 MB of data can be compressed to 5 MB," says McNeill. "Because managers use only the portion of information that they need, you don't need to build a single EIS system for every group."

But end-users and executives aren't the only ones who can benefit from multidimensional capabilities. Another category of EUDA tool is designed for technical professionals who need to analyze large volumes of data, who don't want to write SQL and who are already using a spreadsheet and want something that goes further, says Peggy Bigelow, product marketing manager for BBN/Cornerstone from BBN (Cambridge, Mass.).

"BBN/Cornerstone is designed for engineers and not for statisticians or programmers," stresses Bigelow. Cornerstone consists of a line of products — BBN/Cornerstone and three optional modules, for regression, multiple analysis of variance or principal

## ERP: Integration On A Global Scale

In today's global marketplace, businesses face increasingly stiff competition. As a result, many companies now have multiple facilities in locations throughout the world. Such global organizations require enterprise-wide integration that provides them with strong worldwide planning, manufacturing and distribution capabilities. One of the most effective ways to meet this global challenge is with a fully integrated enterprise resource planning (ERP) system that runs in an open systems environment and provides common information, as well as conversion capabilities.

When integrating multinational operations, the issue of vendor support can be a significant challenge. A company with sites in more than one country may need to run the same ERP system on different hardware. For example: in Mexico, vendor support for HP may be strongest; while in China, DEC might offer the best support. In cases such as these, the information system must be capable of running on a variety of platforms while providing one consistent user interface throughout the world. The solution is an open ERP system that is portable meaning the system can run on most popular business platforms, as well as scalable meaning the system can run on different versions of the same vendor's hardware.

Another problem companies face when integrating throughout an enterprise is allowing end users in various countries to have identical information available in their own language. This need places a demand on the ERP system to provide a "commonality of information." For example, there must be standards that provide users in China with the same database structure, protocols and inquiry capabilities as their counterparts in France. This information also must be available online so that a salesman in one country knows what resources are available at a site in another country.

Handling global transactions can mean dealing with long delays and uncontrollable inaccuracies that cost a business unnecessary time and money. Such delays typically occur in multinational material requirements and financial transactions. Because worldwide companies cannot afford these kinds of mistakes, multinational ERP systems offer a quick and accurate way to solve these problems. For example, the availability of the right amount of materials can become an immediate problem for a production manager who has to order supplies to complete an order. Due to the variety of ways each country defines a unit of measure, it becomes easy to ship an inaccurate amount of materials order. Here's a typical scenario: A plant located in Italy requires 100 liters of a particular material that is measured in gallons by a different plant in New York. To avoid inaccuracies and delays, the information system must be structured with conversion control parameters that are networked through the entire system to ensure that when one entity orders liters, the materials issued are also measured in liters.

In a similar manner, financial transactions can become cumbersome, requiring an ERP system with the capability of making quick translations. If a division in France receives an order from China and is paid in yen, this conversion must be translated quickly and accurately. The information system must be capable of indexing in a way that provides a description field for a part of the index based on the currency specified. Indices might include descriptions for common world currencies, such as francs, yen, dollars, deutsche marks and lira, that would allow a local user to index the appropriate description.

To integrate worldwide sites, today companies should consider an ERP system that was designed with multinational capabilities. Such systems must offer a range of financial and material conversion capabilities, provide commonality of information and run in an open systems environment.— Cathy Lee Taylor is a marketing communications specialist at Xerox Computer Services.

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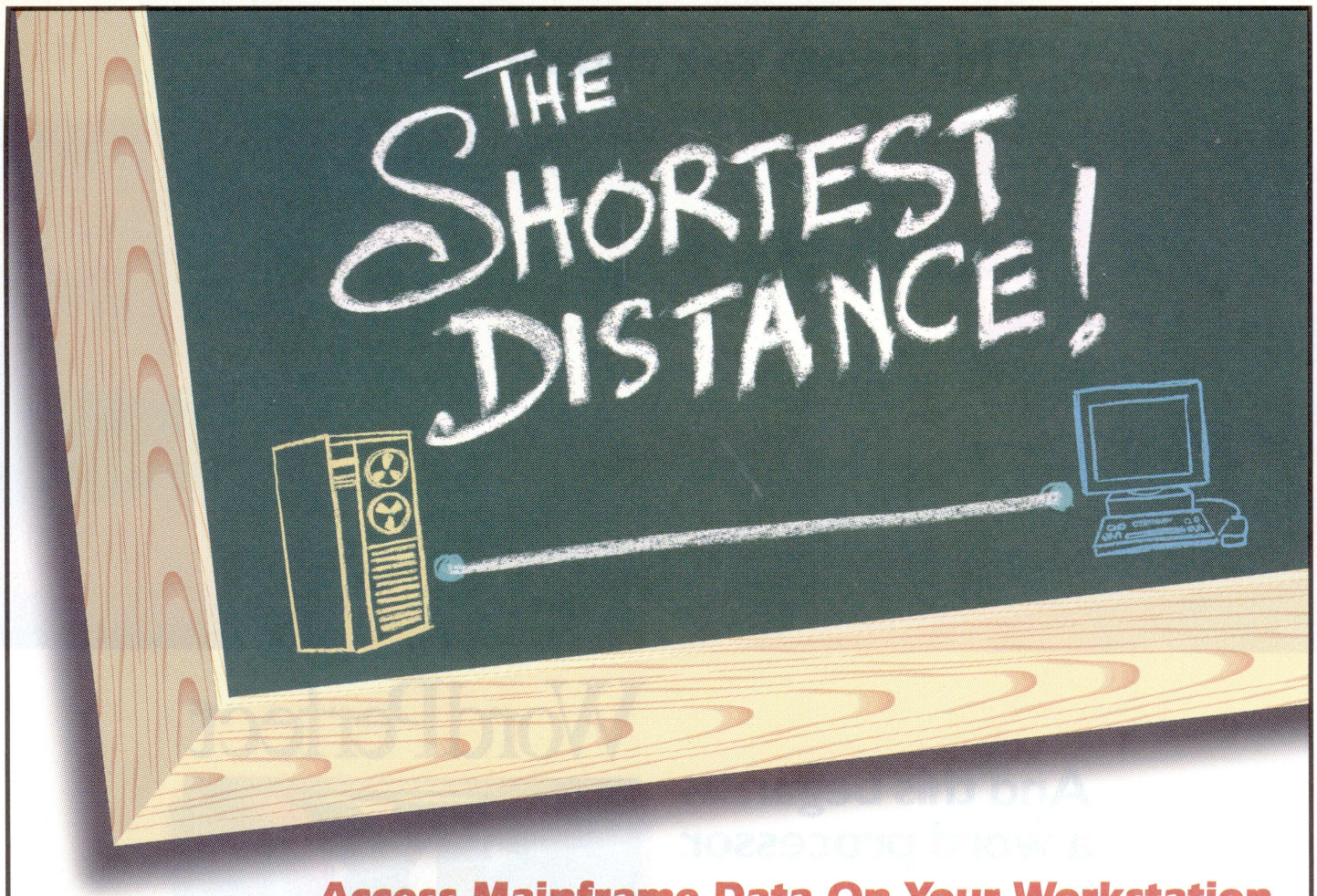
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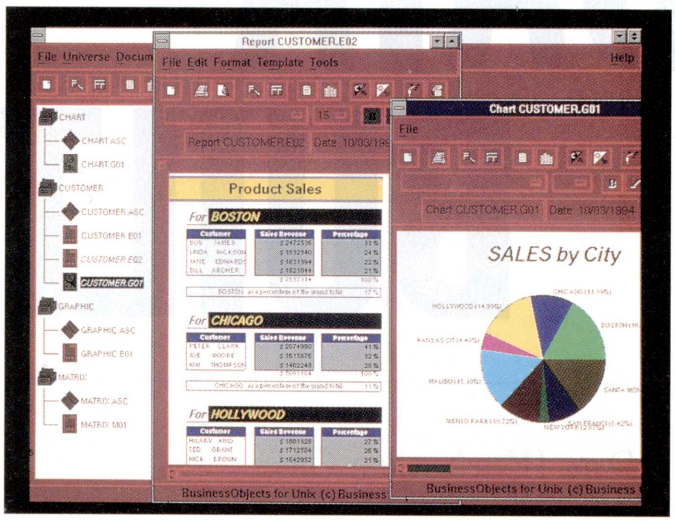
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components analysis. With Cornerstone's Extension Language (CEL) you can extend and customize Cornerstone for your particular application. HP's Colorado Springs Technology Center uses Cornerstone to explore and analyze critical process development data, electrical test data and reliability test data used in developing and designing HP's thickfilm hybrid microcircuits. When compared with a similar software packages, "analysis time was cut to 30 minutes with BBN/Cornerstone" says Bryan Gartner, hybrid research and development engineer at HP.

There's no doubt about it. As end users take on more responsibilities for making day-to-day decisions, the line between




OLTP and DSS is definitely blurring. The trend has not been lost on traditional OLTP vendors. For example, Dun & Bradstreet Software (D&B; Atlanta, Ga.), Lawson Software (Minneapolis, Minn.), SAS Institute (Cary, N.C.) and Software AG (Reston, Va.) are adding best-of-breed third-party EUDA applications while working to integrate new EUDA tools into enterprise-wide solutions.

For example, according to Mark Galloway, director of product marketing, Lawson has been bundling Borland's report writer, ReportSmith, for over a year. "You can extract and query data, and build graphical representations right along side the report." According to Galloway, Lawson's solution is to provide a high level of integration with spreadsheets that provide a Windows-based client with integrated EIS and DSS applications. Via a set of desktop integration utilities called the Lawson Desktop, users can extract data online into a spreadsheet where macros initiate a graphical representation.

Similarly D&B was anticipating their users' needs when it began offering its SmartStream decision support application in 1992. Now D&B SmartStream 3.0 supports multidimensional analysis, according to John Hagerty, product marketing analyst for D&B Software. The next release will provide tighter integration with D&B's financial, manufacturing and distribution, and human resources packages.

The SAS System from The SAS Institute Inc. already provides a modular, integrated set of software applications for enterprise-wide information delivery. While the base SAS software provides an English-like data language data management, analysis and presentation capabilities, other modules provide specific capabilities. For example, SAS/EIS is a menu-driven EIS development tool for developing EIS applications. Additional modules include: SAS/Assist, a menu-driven point-and-click interface that allows users to query without knowing SQL; SAS/Insight for graphical data analysis; and SAS/Spectraview, a 3D scientific data analysis and visualization tool.

Software AG's Esperant is a new product that not only focuses on sheltering users from the vagaries of SQL but also ensures the accuracy of SQL queries. Esperant consists of the Esperant Query System which creates, saves or runs queries and reports, and exports files to spreadsheets or RDBMS tables. The Esperant Administration System for DBAs helps IS managers define views and user profiles. With support for Software AG's Adabase database, DB2 as well as UNIX and OS/2 servers, Esperant demonstrates Software AG's commitment to making end-user access a part of its total enterprise-wide solution.

After spending the past 50 years populating corporate databases, corporations are finally learning to liberate it with sophisticated client-server EUDA tools. One forecast predicts that by 1996 the use of EUDA tools will shift dramatically away from dedicated analysts to all managers and professionals as the preferred way of understanding the dynamics of the business. For some companies looking for that competitive edge, that kind of business intelligence will come none too soon.

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# The House That DATA BUILT

*Data Warehousing Gives Corporations A Competitive Advantage With Better Data Analysis*

**THE FOLLOWING IS A MULTIPLE CHOICE TEST FOR CIOs:** Which of the following will help you improve your company's competitive position. Please circle the correct answer.

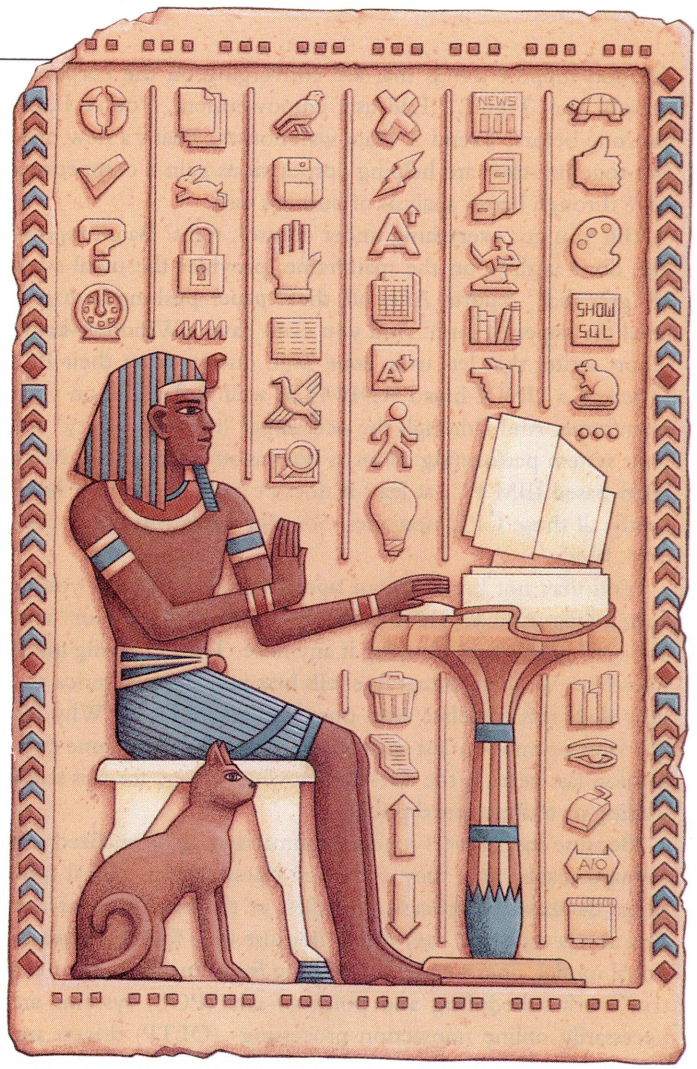
**A.** Executive Information Systems (EIS)
**B.** Decision Support Systems (DSS)
**C.** Management Support Systems (MSS)
**D.** Business Intelligence Systems (BIS)
**E.** End User Data Access Applications (EUDAA)
**F.** Visual Information Access and Analysis Applications (VIAAA)
**G.** Online Analytical Processing (OLAP)
**H.** Data Warehouses
**I.** Multidimensional databases (MDD)
**J.** All Of The Above

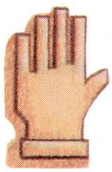
If you circled J, then you've been doing your homework. All the above choices are being used by vendors and industry analysts trying to describe the effect of two

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decision support trends that are converging on the corporate bottom line. Trend 1: End user empowerment. You've heard that one before. Trend 2: Data warehouses. That's a new one. But together they are helping corporations gain a competitive edge through better analysis of business data.

But you got everything under control, right? Batch reporting, done nightly on the mainframe, provides the usual stack of "greenbar" reports. After all, those paper-pushing managers need the paper to push. And you even have a Windows-based report writer that lets users issue SQL queries from their PCs to search a UNIX-based RDBMS as well as flat files on your mainframe. And although the occasional "runaway query" has your system performing about as slow as an original 4.77 MHz 8088-based IBM PC, at least it doesn't crash. Besides, it helps justify all those CPU upgrades. So, you think you got it covered. Not!

You may not know it, but operational data is what you've been selling. And as you've probably already noticed, your "empowered users" aren't buying it anymore. They're asking questions like: Which product line sells best in middle America and how does this correlate with our demographic data? Why did the sales promotion last quarter do better than the same promotion last year? Is the five-day moving average for this stock leading or trailing actual prices?

Because the answers require summarized, denormalized and nonupdateable data, they are tough questions for typical relational databases to process; regardless of the kind of front-end data access tools you may using. Because they follow a transactional model, operational data coming from financial, order entry, work scheduling and point-of-sale (POS) systems are necessarily online transaction processing- (OLTP) driven and record-centric. The data is detailed, normalized and updatable. What you really need is a read-only RDBMS that consists solely of a pertinent subset of your operational data extracted from all the relevant sources and stored for just such decision support queries. If that sounds like a data warehouse to you, go to the head of the class. Put another way, it's not what you're selling that counts, it's how you package it.

The concept of a data warehouse is far from new. IBM introduced the concept with their "Information Warehouse" strategy back in 1991 as a ploy to keep its MVS/DB2 mainframe business alive. But with an open systems-based approach, using a data warehouse to store your company's operational and historical data for decision support is a good idea that doesn't require IBM or a mainframe. However, you may also need data from DB2, IMS and COBOL files stored on an IBM or other mainframes.

Because the data stored in a data warehouse already comes from an operational database or databases already doing transactional work, you already have what it takes to get started. You just need to consolidate, summarize and store it in different way. But that's easier said then done; building a data ware-

## Just The Facts, Just Say OLAP

When it comes to looking for "just the facts," not everyone agrees that a data warehouse is the best solution. Multidimensional databases (MDD) are another alternative to think about when looking to consolidate, store and analyze your business data.

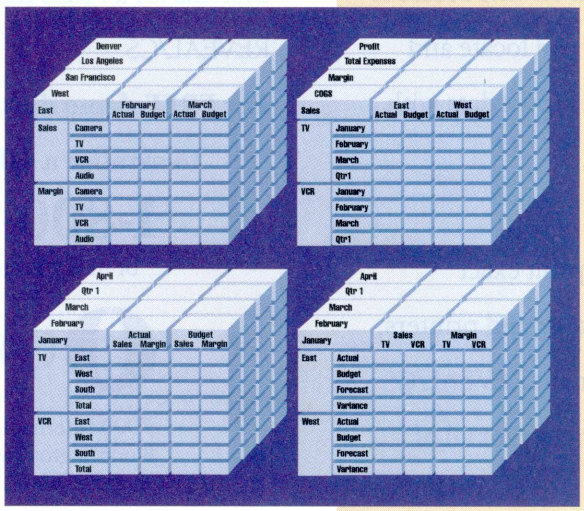
Although MDDs have been around for more than 20 years, they primarily have been used as the database engine in executive information systems (EIS) products. In the early 1980s, EISs were touted as a tool for senior executive managers who needed quick desktop access to summarized corporate information for making business decisions.

A lucrative niche — for a time. But EIS solutions were too costly (around $100,000) and took too long to build (six months or more) for senior executives who often weren't PC-literate enough to effectively use the system. Sometimes the EIS applications amounted to no more than slide shows, which didn't provide much flexibility when looking for business trends.

In the downsized, information-rich, corporations of the 1990s, the reasons for needing an EIS have remained unchanged; but they are now being accessed by PC-literate user/analysts who have responsibility for day-to-day decisions. Hence, the EIS acronym is now being redefined to mean "everyone's information system."

In trying to address this latest corporate IS need for business analysis as well as differentiate themselves from OLTP-based systems, EIS/MDD vendors are now referring to EIS/MDD technology as Online Analytical Processing (OLAP) systems. The term OLAP was first coined by E.F. Codd, S.B. Codd and C.T. Salley in a 1993 white paper titled "Providing OLAP to User-Analysts: An IT Mandate."

E.F. Codd, the recognized "father" of relational technology, wrote that "Relational DBMS were never intended to provide the




***Unlike commercial RDBMSs, which are record-centric, MDDs use arrays to store data in spreadsheet-like "cells." On paper, a MDD resembles a Rubik's Cube. Each side is called a "dimension." That gives a user the ability to "slice and dice" along each of the dimensions of "the data cube" and "drill down" through several layers of consolidated data.***

very powerful functions for data synthesis, analysis and consolidation that is being defined as multidimensional data analysis. These types of functions were always intended to be provided by separate end-user tools that were outside and complementary to the relational DBMS products."

## DATA RETAILERS

When seen as an information delivery system, an MDD can complement a data warehouse by acting as its "front-end" for data access and querying. "OLAP systems can be seen as a data retailer," says Eric Schnadig marketing specialist for Kenan Technologies (Cambridge, Mass.).

Compared to a data warehouse, which stores "manufactured data" from OLTP-based systems similar to the way a physical warehouse is used to store manufactured goods for distribution to retail stores, OLAP systems make it easier for end users ("the data consumers") to shop for data ("the information goods"). "It's the last stop on a value-added data chain," says Schnadig.

In other words, if the data for analysis requires operational and consolidated data, consolidated data can be stored in an MDD server, the operational data can then remain in an OLTP-driven relational data warehouse.

"We are seeing the [data retailer model] more and more," says Tom Rauh, vice president of Research and Planning (Cambridge, Mass.), a DSS/EIS consulting firm. "Data warehouses are economies, not solutions," says Rauh. "Having all that data in one place has, for the most part, been unfullfilling because it didn't solve any problems."

It's a trend that some OLAP vendors are making the most of. For example, this past August, IRI Software (Waltham, Mass.) and Red Brick Systems (Los Gatos, Calif.) announced a strategic development relationship to integrate IRI's Express MDD applications with Red Brick's Red Brick Warehouse.

One pharmaceutical company that Rauh works with uses a 1 GB data warehouse and Kenan Technologies Accumate ES for monitoring their contracts with retail pharmacies, hospitals and HMOs. The data warehouse stores detail data about drug sales and costs derived from an IBM mainframe. A subset of that data is then summarized and downloaded to Kenan Technologies' Accumate ES.

"About 90 percent to 95 percent of the analysis doesn't require all the detail data," says Rauh. But via a LAN gateway, it's there for those who need it. Instead of accessing millions of records, users search through only a few hundred, explains Rauh.

After using an Ingres-based data warehouse and SQL-based query tools for several years, the HP Laser Printer Division (Boise, Idaho) is now experimenting with several different MDD applications. "Ease-of-use is the driving criteria," says

house is not for the faint of data. Like any IT solution, you can simply throw a cadre of programmers and some cash at the project. But that solution may require time, skills and resources not readily available or expendable. Or you can get help from HP's Open Warehouse Program.

Established just over a year ago, HP's Open Warehouse Program was developed out of HP's own internal experiences with building and using data warehouses. "One internal sales/marketing data warehouse has 250 GB of data," says George Ferguson, HP's Open Warehouse program manager. The Open Warehouse Program also includes help provided by HP's Professional Services Organization (PSO), its consulting services division. As the name implies, HP's Open Warehouse takes an open systems approach — solutions are developed to work with

Mark Parisot, IT engineer. The data warehouse helps track orders and sales of the LaserJet product line. And it has worked well, according to Parisot. But multidimensional technology does lend itself well to querying large amounts of data quickly. Also, by not querying the data warehouse directly, there are performance gains because network traffic is reduced.

"We think it's better to have the data warehouse for people who want to look at the operational data in strange and unusual ways with any [standard SQL] query tool that they might want to use. But for a subset of users who need the performance or the multidimensional view, we are thinking about MDDs," says Parisot.

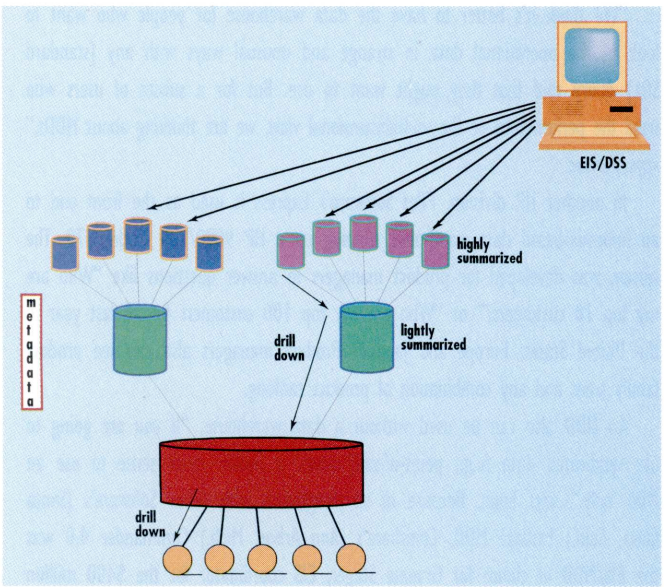
In another HP division, Pilot Software's Express is used as the front end to an Informix-based data warehouse running on a HP 9000/800 Model H70. The system was developed for product managers to answer questions like "Who are my top 10 customers?" or "Who are my top 100 customers for all last year in the United States, Europe and Japan?" Product managers also can see product family trees and any combination of product ranking.

An MDD also can be used without a data warehouse. "If you are going to use syndicated data (e.g., point-of-sale data), it makes more sense to use an MDD only," says Rauh. Because of its integration with Arbor Software's (Santa Clara, Calif.) Essbase MDD, Comshare's (Ann Arbor, Mich.) Commander 4.0 was the EIS/MDD of choice for Graeme Stager, EIS coordinator for the $400 million Lowens Corp. of Canada. With Lowens, owners of funeral homes, cemetaries and crematoriums across North America, Mexico and Puerto Rico, who was growing at 25 percent a year, Stager was looking for a financial reporting system for regional vice presidents and senior accounting executives. "We needed a tool that could serve both users," says Stager. In the pilot stage with three users since August, Stager is now in the process of rolling out the system to 10 users who are all are using IBM ThinkPad notebook laptops as clients. According to Stager, "The data warehouse concept needs to be developed more."

With workers no longer necessarily bound to the desktop, many MDD/EIS products support the needs of notebook users. For example, Gentium is a new EIS/MDD application from Planning Sciences Inc. (Littleton, Colo.), a U.S. subsidiary of a U.K. firm of the same name. Using Gentium, notebook users can transfer information to a "private area" on the hard disk, thus taking only the information they need with them. When workers return to the office, Gentium's CORBA-compliant object-oriented request broker automatically updates the information to or from the notebook. —GAT

HP and non-HP platforms. "We've worked on over 100 data warehouse projects" says Ferguson.

For example, using Oracle's RDBMS (running on an HP 9000 Model G40 and H50 servers), a global consumer packaged-goods company created a data warehouse derived from four sources: wholesaler shipments stored in DB2 files on an IBM 3090; wholesaler shipments to retailers stored in IDBMS on a IBM 3090; retail inventory data; and retail POS data. And when 7-11 Japan Co. Ltd. (Tokyo, Japan) wanted to track daily sales and inventory of their 5,000 retail outlets they designed and built, with assistance from HP's PSO, a 100 GB data warehouse using Oracle's RDBMS running on an HP 9000 Model 870. Some other corporate customers of the Open Warehouse Program include 3M, Pillsbury, and Florida Power and Light.




Source: Prism Software

***The structrue of the data in the warehouse supports the drill-down process.***

But it's true what they say, Ferguson points out, "90 percent of the work in developing a data warehouse is getting the data cleaned and transformed and into a useful format." That's why there are data extraction and cleansing applications like Prism Warehouse Manager from Prism Software (Sunnyvale, Calif.). "Prism is designed to build, maintain, update and navigate through data warehouses," says Jim Ashbrook, president of Prism. But he adds, "It's not a CASE tool." Prism's Warehouse Manager also is included as part of HP's Open Warehouse Program.

The Prism Warehouse Manager 4.0, a PC-based application, automatically extracts data from a number of different legacy and RDBMS data sources (DB2, DEC Rdb and RMS, IDMS, IMS, MVS Sequential Files, VSAM, Informix On-Line, Oracle, Sybase, and Tandem's Enscribe and NonStop SQL) and transforms it into integrated data warehouse information for the following target databases: DB2, Informix, Oracle, Red Brick Warehouse, Sybase SQL Server and Teradata. "You can build a functional data warehouse in six to 12 weeks instead of six to 12 months," maintains Ashbrook. "There is a three- to five-fold productivity improvement on the initial build and a considerable financial payback on the maintenance side."

Another important aspect of a data warehouse is what's called meta data (information about data, analogous to a card catalog) that provides administrators and end-users with a historical record and reference point about the evolution of the data in a data warehouse. Prism's Warehouse Manager also provides MetaSource, an application which helps maintain meta data. Florida Power and Light (FPL) DSS analysts track procurement data about vendors, prices, purchase orders, materials and receipts from a data warehouse in a distributed Sybase environment on HP and NCR servers.

"Meta data is the key to success in the warehouse," according to Jonathan Geiger, FPL's supervisor of Enterprise Modeling and Data Management. Other companies building data warehouses with Prism's software include Bank of Boston, BlueCross/BlueShield of Missouri, Caterpillar, Comerica Bank, Hughes Aircraft, Inland Steel, Ontario Lottery, Xerox Corp. and Zurich Insurance.

Although most companies are using popular RDBMSs from Informix, Oracle and Sybase for their data warehouses, there are several limitations when using relational technology for data warehouse applications:

*Performance.* Because RDBMSs use normalized tables (each record must be unique), multiple joins are necessary when processing the kind of summary and comparison queries necessary in business analysis. If several users submit complex queries, especially those requiring summarization (and arithmetic), performance may be severely crippled because of the processing overhead.

*Size.* Although pre-joined tables can help with processing complex queries, tables get so large (because of the redundancy of data) that relational systems must perform additional disk I/Os to retrieve the data. And, they are unable to keep all the retrieved data in memory. Once again, performance is critically affected. Large tables also need large indexes to directly access specific records or groups of records which increase space requirements and also further decreases performance.

*No Time Series Data Types.* Commercial relational technologies aren't designed to handle time-sensitive comparisons that many business analysts need answered (e.g., compare total sales in the western region for flannel shirts from last year and this year). Although some commercial RDBMS vendors have now added time series data types, their usefulness is limited.

Alternatives to commercial relational technologies include multidimensional databases (*see sidebar*) and a specialized RDBMS from Red Brick Systems (Los Gatos, Calif.) called Red Brick Warehouse. Designed specifically for data warehouse applications, Red Brick Warehouse 2.0 addresses the limitations of commercial RDBMS by using precomputed join paths, finely tuned indexing algorithms and time data types. "Red Brick has some very sophisticated mechanisms for sorting and storing data," says Mark Hanner, senior analyst at the META Group (San Francisco, Calif.).

Red Brick was initially targeted to consumer packaged goods companies (for example, General Mills, Playtex and Sara Lee) where the competitive need for business analysis information has been clearly understood. In June 1993, however, Red Brick introduced Red Brick Warehouse 2.0, a horizontal application for use by all industry segments. Now, because of deregulation in the health care and telecommunications industries, with pressure to decrease costs and improve their customer responsiveness, these emerging industry groups are taking advantage of data warehouses. In fact, in July 1994, HP's Healthcare Information Systems Group signed an agreement with Red Brick.

HealthSource (Burlington, Vt.), a network HMO service is now rolling out a Red Brick Warehouse data warehouse application. After a six-month pilot, 30 users will be extracting enrollment, patient and physician data, according to Brian Harney, tech support specialist at HealthSource. The 65 GB data warehouse runs on an HP 9000 Model 590; previously a 14 GB Oracle 7 RDBMS (running on a 33 MHz 486 Compaq-based server) was used. Performance was the main reason for the switch, says Harney. Other companies using Red Brick Warehouse include Longs Drug Stores, Hughes Aircraft, Tufts Associated Health Care and Bell South Cellular.

From the recent spate of data warehousing articles in the trade and business press, it looks like the time has come for the data warehouse. Front-end SQL access and query tools like Cognos Impromptu or Borlands' Report Smith have grabbed most of headlines in the past. But says HP's Ferguson, "front-end tools by themselves are solely insufficient for a data warehouse." The Meta Group's Hanner sums it up this way: "People have discovered that running arbitrary queries with fancy front ends, even with certain [administrative] protections, take hours to run. So there's been a tremendous increase in interest in the data warehouse where you can transform data into more useful format."

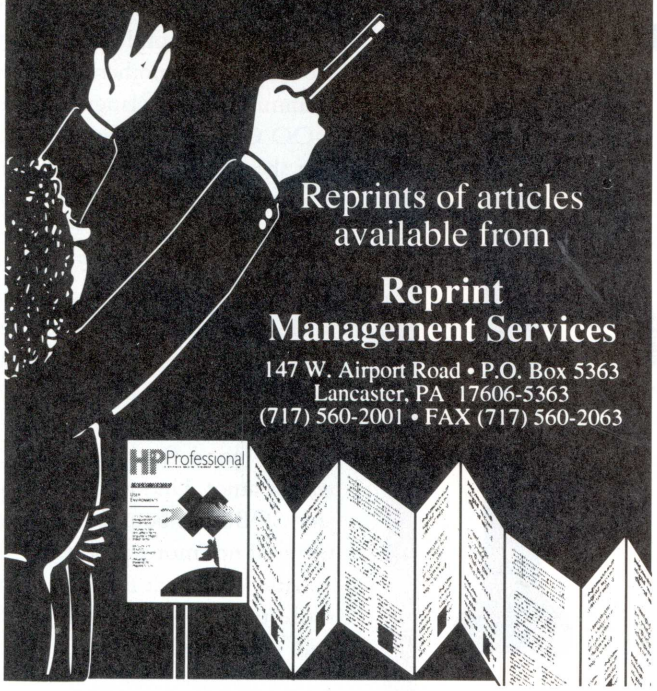
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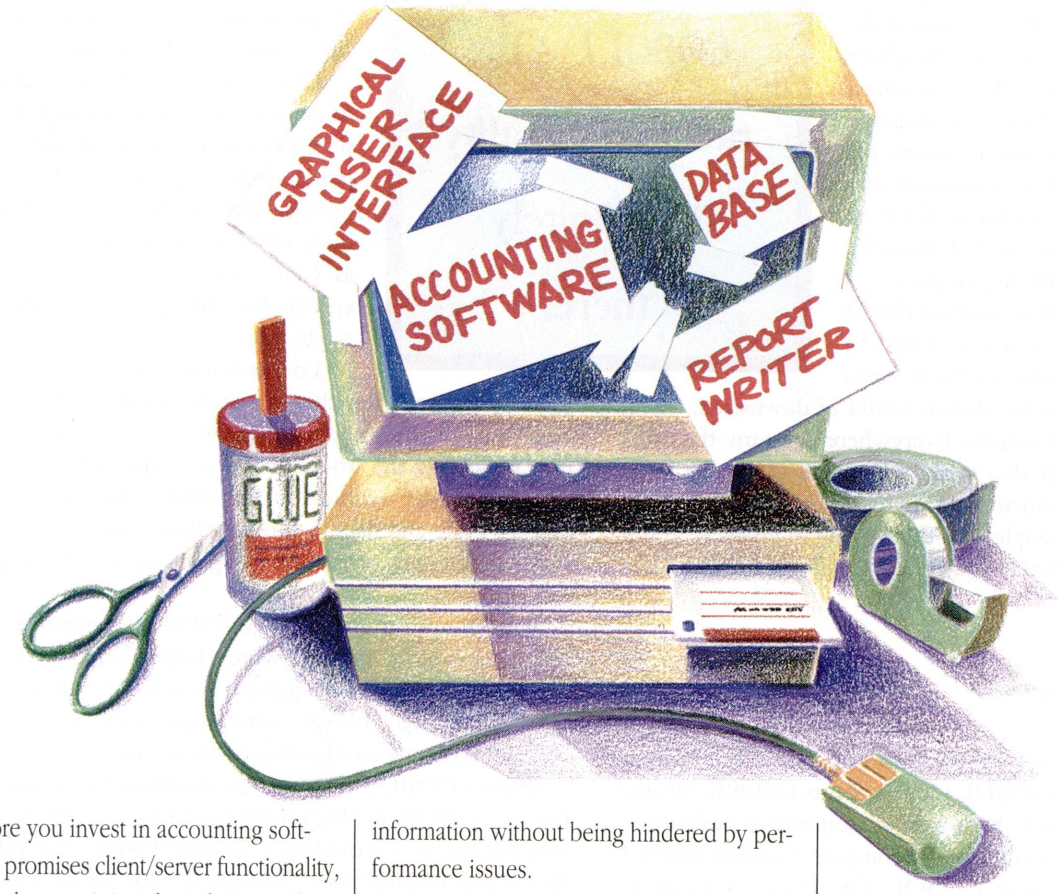
## A Philosophically Practical Journey Through Micro Focus Object-Oriented COBOL

*Gordon McLachlan*

*With recent announcements of* object-oriented (OO) COBOL products from IBM and Micro Focus, it's time for some deep philosophical pondering. Does the world need another OO programming (OOP) language? Or is OO COBOL an abomination that should be put down before it becomes a menace to the natural order?

A case can be made against COBOL. Indeed, it has been made, many times. COBOL is excessively verbose. Coding COBOL day after day can cause repetitive motion injuries. It's also no good for bit-twiddling and whatnot. Undoubtedly, Object COBOL is bound to have as many, if not more, problems. As a matter of fact, it involves even more typing. That having been said, who cares?

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To this dinosaur's walnut-sized brain, Object COBOL makes as much sense as objectified versions of any procedural language. If you're going to ignore the purists — like most of us — and opt out of "real" OOP languages like SmallTalk, one hack is as good as another.

In fact, COBOL may have the moral high ground here, and it's not just the bazillion lines of COBOL code kept in defiance of politically correct computer pseudo-scientists. While the C monkeys denigrate COBOL for its lack of elegance, at least you can read and maintain the code. I wouldn't wish development of a decent-sized business system in C++ on my worst enemy. On second thought, maybe I would, but not on you guys.

Actually, think of implementing Object COBOL as a humanitarian issue. Think of all those poor mainframe COBOL jocks without a future in the brave new world of downsized, right-sized, client-serverized systems. Everywhere you turn, the news is bad. The rap is that they make too much money, it costs too much to retrain them and they're too old to learn new tricks anyway. Well, these people aren't just going to go away. If the choice is welfare, euthanasia or Object COBOL, I'll take COBOL, thank you.

**You can quibble about the elegance of Object COBOL but the raw functionality is definitely there.**

## Down And Dirty

SO WITH THESE LOFTY ideals in mind, I set out to eyeball the Micro Focus COBOL Option for its COBOL Workbench product. I wasn't able to do a comparative evaluation, because a) there wasn't anything to compare it against and b) I don't know enough about COBOL, Object or otherwise to pull it off.

The software arrived in a real big box with 20 manuals and about as many floppy disks. In fact, the box was about as big as the one I got with Microsoft's Visual C++ (the previous record-setter), so from that standpoint, at least, Object COBOL measures up to C++.

Unfortunately, all those manuals were just for the plain old COBOL Workbench. All the documentation for the Object COBOL option is provided on disk in text files and online hypertext help files. While there are plenty of them, and the docs are reasonably well put together, some of us old hacks still like books. Fat books with lots of pictures. Browsing hypertext is OK when you're in the heat of battle, but I find printed reference material better to learn from.

Of course, from my vast and wide-ranging experience, I know you can't judge software from its box. So, I actually loaded the software. Twenty-one disks (there is no CD-ROM version yet) and an hour later, I had 40 MB of COBOL on my hard disk. Oh boy.

The Micro Focus COBOL Option provides the Object COBOL programming language, the run-time environment needed to handle object instantiation, messaging and dynamic binding, a foundation class library which includes classes for developing GUIs, and an integrated development environment that includes a language-sensitive editor, a class browser and a source-level debugger.

Of course, any language attempting to be object-oriented has to support the basic OO concepts of encapsulation, inheritance, polymorphism, instantiation and dynamic binding. Indeed, Object COBOL does, and adds a couple of other goodies as well. You can quibble about its elegance, but the raw functionality is definitely there.

Encapsulation is the technique of storing data and code together as a single entity — the object. The codes that provides the behavior of an object are called methods. Following the strictest rules, an object's data can only be changed by the methods of that object. By encapsulating an object's code and data in this way, you build a natural wall of sorts around each object insulating it from the rest of your system.

It is encapsulation that gives OOP its reputation for providing reusable code, and which helps shorten development times by localizing code changes to stop them from cascading through a system. It's also what makes your brain hurt when you are designing an object-oriented system.

Object COBOL supports encapsulation by adding an OBJECT-STORAGE SECTION to standard COBOL's DATA DIVISION, and providing a separate PROCEDURE DIVISION and WORKING-STORAGE SECTION for each object class and instance. In effect, each class is a separate COBOL program accessible from others.

An object class is a generalized definition of an object, while an instance of that class is a specific occurrence of that object. Data and code assigned to an object class is used by the class when it is first registered, or referenced. The instance's method code is used whenever a specific object is messaged. Messaging — analogous to a procedural program's function calls — is handled by the only new verb in Object COBOL, the INVOKE statement.

Inheritance is supported by syntax which allows you to use any existing class' data and methods as starting point for a new class definition. At this time, Object COBOL supports only single inheritance. This means it can only use the definition of a single class as a parent. Some other OO programming languages, like C++, support multiple inheritance, allowing characteristics and behaviors of different classes to be combined.

In practical terms, polymorphism means that an object

method with the same name will take different action depending on the object to which it is attached. A "draw" method for a graphical "line" object should draw something different than the "draw" method of a "circle" object. That's about all there is to it, and Object COBOL does it.

The Object COBOL Run-Time system handles instantiation, messaging and dynamic binding. Any OO language must allow you to create new instances of object classes on-the-fly. At compile time, the compiler has no idea how many or what kind of objects you are going to instantiate, so the details have to be handled at run-time. For the same reason, messaging and polymorphism also must be resolved at run-time.

That's the basics. It's not real pretty, but it's effective. But a couple of other features make Object COBOL even more interesting.

**Be aware that the "persistence manager" supplied with Object COBOL does not perform well enough to be used as a DBMS.**

A much needed feature of Object COBOL is something Micro Focus calls Requirement-based Vocabulary. That's techno-speak for user-defined functions and verbs.

The functional notation of the Requirement-based Vocabulary is similar to the intrinsic functions that finally were added to the COBOL language in its latest iterations. Programmers also can use the Requirement-based vocabulary to add user-defined imperative statements (verbs) to the language.

Another bonus is Object COBOL's support for object persistence. By invoking the appropriate methods, objects' data can be stored, restored and backed up for future use. While persistence is not a requirement of object-orientation per se, it is a nice touch. Just be aware that the "persistence manager" supplied with Object COBOL does not perform well enough to be used as a database management system, as Micro Focus itself points out in the documentation.

## Oh, Oh or Oh No?

SO, IS THE PRODUCT worth it? I doubt if Object COBOL is going to lure SmallTalkers and C++ fans away from their chosen weapons, but it sure might stop some defections.

Unfortunately, it's more like a toy gun than the real thing and you can't miss the bright orange with which Micro Focus has painted the barrel. They're positioning the currently available version as an introductory product "designed for anyone interested in evaluating and deploying object technology." In other words, don't blame them if it doesn't work in production.

The Micro Focus Object COBOL Option is currently available only as an add-on to the Micro Focus Cobol Workbench Version 3.2 for DOS, Windows and OS/2. This is a 16-bit implementation available to users of the COBOL Workbench for a "nominal handling fee" of $40.

While the run-time environment isn't yet ready for prime-time, Micro Focus promises to remove the introductory label when a 32-bit version of the language is released for Chicago, Windows NT and OS/2 by the end of this year. Hopefully, it will be on the streets by the time you read this article.

Micro Focus also has announced its intention to support UNIX versions of Object COBOL "later in 1995," but it has not announced which platforms it is going to support, or specific delivery schedules.

The lack of UNIX support really limits Object COBOL's usefulness, unless you're hell-bent on using NT as an enterprise platform. Given that the major excuse for Object COBOL is to let you "re-engineer" that old mainframe code, the lack of viable server platforms makes the exercise somewhat futile. About all you can do is play at it until the UNIX version appears, and if you're writing code solely for PC platforms, there are probably better alternatives.

The state of Object COBOL standards also is a sticking point. Object COBOL has extended the syntax of the ANSI 85 COBOL standards, based on a 1993 snapshot of ANSI X3J4 COBOL standards. While this snapshot gives a reasonable idea for where standard OO COBOL is headed, the final standard is not expected until 1997, so some of what Micro Focus is doing is speculative.

To help overcome this objection, Micro Focus has promised support of the new standard when it is finalized, as well as upward-compatibility of the current Object COBOL dialect. Still, when it comes to standards, the motto is still caveat emptor.

Object COBOL is an interesting product that is bound to make some IS hearts glad, and drive others crazy. Unfortunately, it also reinforces the idea that object-orientation is something to think about, and not something to do.

With the confusion around standards for system-wide interoperable objects like the Object Management Group's Common Object Request Broker Architecture (CORBA) and Microsoft's Object Linking and Embedding (OLE), the paucity of class libraries and the immaturity of tools all ganging up on us, object-oriented programming seems to stay just out of reach.

By the time things start to settle down, we'll probably be arguing over a new language. Object RPG, anyone?

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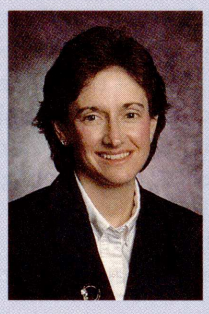
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Jill Huntington-Lee

# Tornado Watch At HP

According to the U.S. National Weather Service, hurricane season officially ended late November. But right now, my mind is on a special "tornado" brewing out in Fort Collins, Colorado at HP's Network and System Management Division.

News is leaking out about the long-awaited HP OpenView Version 4.0, which HP has dubbed "Tornado"—presumably because the system is supposed to take the world by storm. I, myself, may have been a little less presumptuous in code-naming this product, using a moniker more like "whirlwind and a drizzle." But then, marketing is not my thing.



**Editor's Note:**

*In 1995, our columnists will concentrate on the issues, problems and solutions of choosing, implementing and maintaining an open HP enterprise. This month, we introduce Jill Huntington-Lee's Network Management column.*

*Huntington-Lee brings over 11 years experience in computer and data communications. Her new column focuses on network management, product analysis and the management of distributed UNIX environments.*

However, it's my business to know everything there is to know about the network and systems management market — particularly products that support the Simple Network Management Protocol (SNMP). I've been studying, consulting on, and writing about HP OpenView since its inception in 1989. The product has a remarkable history, if you compare it's success with other more ambitious efforts that eventually failed, such as AT&T's Accumaster Integrator and DEC's Enterprise Management Architecture (EMA).

The first release of HP OpenView was essentially a glorified Management Information Base (MIB) browser — a product that puts a fancy GUI on top of a simple program that traverses a tree-structure of raw data describing the status and interface statistics of Internet Protocol (IP) bridges, routers and hubs. But HP came up with a way to make a simple SNMP MIB browser the centerpiece — or "platform" — of an entire open systems and network management architecture. Today, HP OpenView is arguably the most influential, if not best-selling, UNIX-based SNMP management platform in the world.

The secret to HP's success was its emphasis on openness and flexibility — including a well-designed developer's kit that enables users and ISVs to customize OpenView to suit specific network needs. Over 100 vendors are developing (or have developed) value-added applications for HP OpenView, ranging in function from

trouble ticketing to SNA management.

But up to this point, HP OpenView has been less than adequate for handling alarms and depicting topologies of networks with over 3,000 nodes. In large networks, the process of discovery — detecting IP nodes, mapping network topology and editing the network map for readability — can take hours using HP OpenView. Even after discovery and mapping is complete, a single device failure in a large network can make HP OpenView light up like a Christmas tree.

To counter this, companies buy multiple copies of OpenView to handle more nodes — but this is problematic, because these separate OpenViews can't efficiently share data. In networks where relationships between protocols, applications, servers and desktop systems are complex and voluminous, the inability to share data severely limits the effectiveness of fault isolation and problem resolution.

HP is well aware of this shortcoming, and has taken steps to solve the problem. For example, HP is licensing NerveCenter technology from NetLabs Inc. NerveCenter's conditional-state polling and alarm handling software can increase polling efficiency across large networks, and help slow down the "Christmas tree" effect of sympathetic device alarms. Furthermore, when Tornado arrives in mid-1995, users will benefit from a new distributed discovery feature that should detect network nodes faster and more efficiently. Even more valuable will be support for a distributed user interface — allowing technicians to access Tornado from different points on a subnet. Tornado also will support SNMP v2 — providing improved security and even greater bulk data retrieval efficiencies.

However, larger networks comprising tens of thousands of nodes, require support for multiple, geographically dispersed OpenView users — users that need to share information and screens without resorting to sending X-Window bit-maps around the country. But the real killer function, is a common data repository. This means one storehouse for all types of management data — IP events, SNA events, hardware and software inventory data, device history and everything else that OpenView and third-party applications collect and use. Right now, each application has its own database, and OpenView itself stores data in several databases, and requires users to call up multiple submaps to obtain network status information.

Will HP's Tornado annihilate all competing network management products in its path, such as IBM's NetView/6000 and SunSoft's SunNet Manager? I doubt it. But as a precursor of long-term climatic changes ushering in the age of distributed management, the Tornado from Fort Collins is definitely on the right track.

*Huntington-Lee's Internet address: 0004463809@mcimail.com*

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# DiffereNT Configurations

If you work with Microsoft Windows NT, you know that the final release of Version 3.5, the "Daytona" release, is now available. This release includes a number of major enhancements to NT. It also provides a better implementation of "Windows on Windows," NT's subsystem for running existing 16-bit Windows 3.1 applications, as well as improvements in performance for existing MS-DOS applications.

As you might expect, NT treats Windows 3.1 and MS-DOS applications differently. The environment for MS-DOS applications is defined by configuration files CONFIG.NT and AUTOEXEC.NT, found in the SYSTEM32 sub-directory under Windows NT. To set the environment for MS-DOS applications running under NT, modify these files as necessary. I use a dual-boot system that lets me use MS-DOS (and Windows) or Windows NT. I've found NT does use environment variables defined in C:\AUTOEXEC.BAT, but don't count on this working in all environments and future releases of NT.

Like Microsoft, I advise you to use CONFIG.NT and AUTOEXEC.NT to define parameters for MS-DOS applications. Windows NT supports some options within these configuration files that can be useful. When you start an MS-DOS application, you normally do not see any lines echoed from CONFIG.NT and AUTOEXEC.NT. If you want to see the lines echoed to the console, add the command **ECHOCONFIG** to CONFIG.NT and the lines echo to your screen as NT loads the files. This can be useful in debugging batch files, or just to be sure NT is loading your application as you think it should. Note: if you use **ECHO OFF** in AUTOEXEC.NT, it will override the **ECHOCONFIG** setting.

When you start the MS-DOS command interpreter from within an MS-DOS application, NT runs COMMAND.COM from the SYSTEM32 subdirectory rather than the NT command interpreter CMD.EXE. If you want to use CMD.EXE rather than COMMAND.COM, add the statement **NTCMD PROMPT** to CONFIG.NT.

When using COMMAND.COM from within a shell, you can start any type of application. While this is a nice feature, it can interfere with TSRs or some other MS-DOS applications. To make sure you won't accidentally run non-DOS applications, you can add the statement **DOSONLY** to the CONFIG.NT file. This does two things: first, the **VER** command returns **MS-DOS 5.00.500** rather than **Windows NT 3.5**; second, you will see the error **This program cannot be run in DOS mode** if you try to start any non-MS-DOS application. Note that the **NTCMDPROMPT** effectively overrides **DOSONLY**.

## SPECIFYING OTHER START-UP FILES

While CONFIG.NT and AUTOEXEC.NT let you define the environment for all MS-DOS applications under NT, some-

times you might want to use a different environment for one or two MS-DOS applications. Under Windows NT, you can actually override which files initialize the environment for MS-DOS applications, effectively overriding the default files, by using a new feature of the PIF Editor.

When you start the PIF Editor, you will see the Advanced button that you are familiar with from Windows 3.1. However, you also will see a button labeled Windows NT. If you click it, you have the opportunity to define new names for the CONFIG file and the AUTOEXEC file. This lets you create a unique environment for any MS-DOS application, and can be handy when one or two of your applications don't use the same environment the rest of your MS-DOS applications use.

### WINDOWS 3.1 APPLICATIONS

If you will be running MS-DOS applications under NT, you can load whatever device drivers are required, and whatever environment variables need to be set, by editing the contents of these two files. NT does not use these files if a different start-up file is listed in the PIF file for the application. Note that Windows applications, even 16-bit Windows 3.1 applications running under NT, do not use the MS-DOS environment; they use the environment defined in the NT control panel applet.

To use existing 16-bit Windows 3.1 applications under NT, use the control panel applet to define the environment. This environment will be set when you start any Windows 3.1 or NT applications, so be sure the environment includes correct values for both environments. For example, on my system I have Windows 3.1 and NT installed in different directories. When I run 16-bit applications like Visual Basic (VB), I have to be sure the WINDOWS\SYSTEM directory is in my PATH so VB can locate its DLLs.

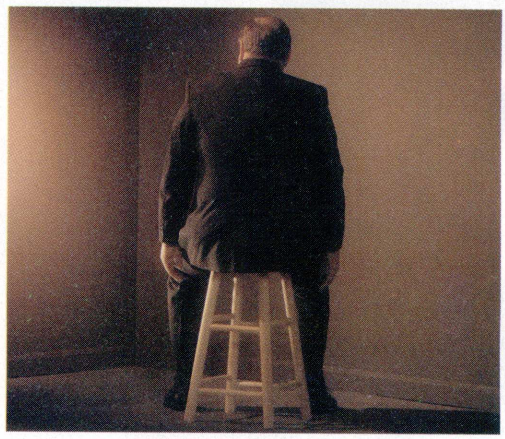
One trick you can use to run Windows 3.1 applications on NT is to create a PIF for the windows application and start the application using the PIF. This way, you can specify a CONFIG and AUTOEXEC file for each Windows application in the PIF Editor. When you start the PIF, NT performs the initialization you specify in the CONFIG and AUTOEXEC files, normally CONFIG.-NT and AUTOEXEC.NT. Then the Windows application starts, and you use it as you would any other Windows application.

As you use NT, you'll begin to see many of the capabilities and implementation details of future versions of Windows. Over the coming months, we'll be talking about these features and about the new environments when they are available.

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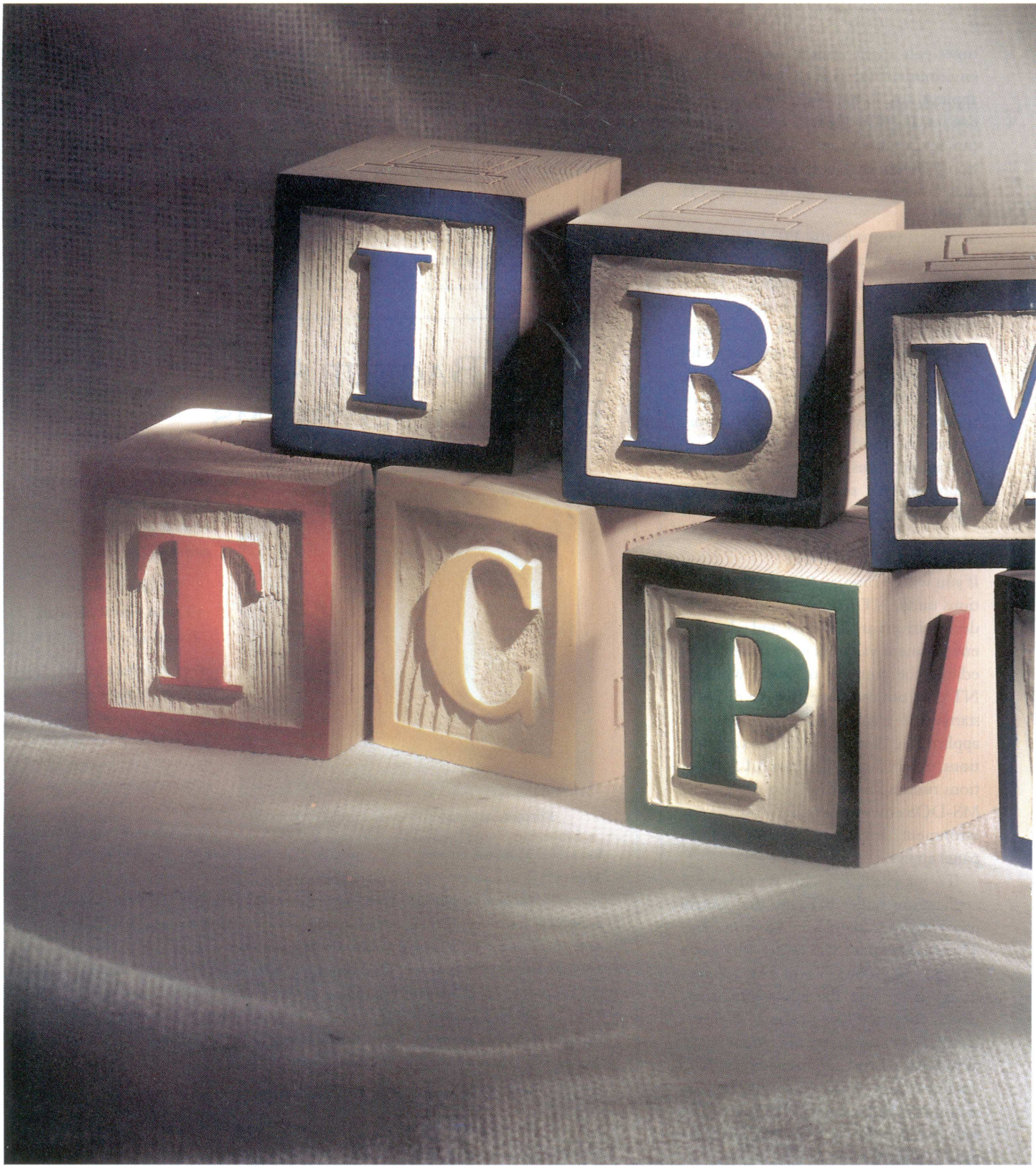
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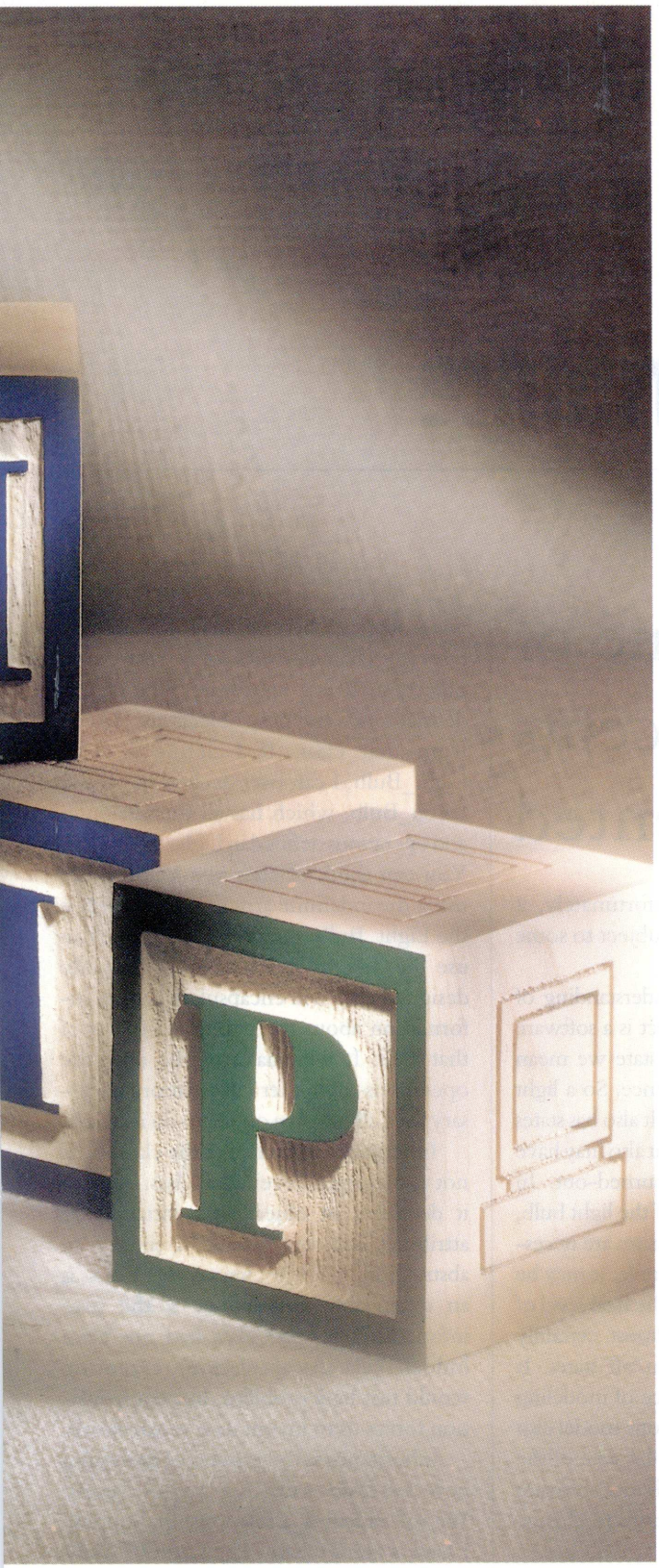
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Richard Riehle

# Understanding Inheritance

Inheritance is one of the critical concepts in object-oriented programming (OOP). Unfortunately, it also is a concept which is subject to some misunderstanding.

First, let's revisit our understanding of objects and classes. An object is a software entity which has state. By state we mean some condition of its existence. So a light bulb has states of on and off. It also has states of cold, hot and hotter. And it also may have states of serviceable and burned-out. In defining a software model of the light bulb, we must determine which states are necessary to that model. For example, it may be unnecessary to account for the heat level of the light bulb, but it is almost certainly important to model the on/off states. It follows, from the importance of modeling the states of an object, that our model also needs some way to inspect the state of the object. And for some models, our software may actually include operations to change an object's state.

The notion of state is essential to modeling software objects. Sometimes a state is constant and we only make inquiries. Other times state is variable, and our software needs operations to effect and detect the changes.

A class is a software pattern for a software object. The class may describe the relevant characteristics of a real-world object, such as a light bulb. The class is defined once and new objects are created from that class. If I define a class, Light_Bulb, I can later declare an object, Lamp_Bulb, which has all the attributes and operations defined in Light_Bulb class. You can think of class as a Light_Bulb, using the indefinite article, a. An object is the Light_Bulb_Instance, where one can use the definite article, the. A properly designed class will encapsulate certain information about the potential objects of that class. It will make public only the operations (and other information) necessary for a client of an object to do its work.

Inheritance is applied at the class level, not at the object level. The class, because it describes an object's potential states, attributes and operations, is simply an abstraction. In OOP, we say that a class is an extendable abstraction. If the state information for the class had not been hidden (via encapsulation) extension would not be a problem, but encapsulation forces us to invent new mechanisms.

Inheritance is the process of deriving a new class from an existing class (or classes). We call this an is_a relationship. Suppose I have a class, Chair. The states of Chair modeled as software might be occupied and unoccupied. The operations to change the state of the chair, could be defined as sit_down and stand_up. We can have multiple chairs (objects) of this class, as long as they correspond to the characteristics defined for the chair class.

Next, we can create a new class, inherited from chair. For example, suppose we want a Swivel_Chair class. Such a class continues to be a chair, but it is more specialized. The additional states could be reckoned in degrees or compass points, but it is still a chair. We could phrase this as, class Swivel_Chair is_a class Chair with additional attributes. One could further extend Swivel_Chair by making it an Executive_Chair with additional tilted states. Also, it would be possible to extend class Chair to something called Rocking_Chair.

## INHERITANCE VS. ASSOCIATION

Sometimes it is useful to create a new class by inheriting from more than one parent class. This is called multiple inheritance. In the Swivel_Chair, above, there might have been a parent class for Rotator_Mechanism as well as a class Chair. These two classes combine to create a Swivel_Chair. However, one must be careful in this analogy. Not all object-oriented languages support multiple inheritance, and those which do sometimes introduce as many problems as they solve. There is a mechanism, other than inheritance, for building a larger class from a set of smaller ones, called association. And there is a special form of association called aggregation.

**FIGURE 1**

```
class shape{                                    // class named shape
  public:                                       // visible part of the class
    shape (int x, int y);                       // "constructor" for shape
    virtual void draw(void);
  private:                                      // start hidden part of class shape
    int x;                                      // x coordinate, encapsulated
    int y;                                      // y coordinate, encapsulated
};

class circle : public shape {                   // inherit circle from shape
  public:                                       // visible part of shape
    circle (int x, int y, int radius);          // "constructor" for circle
    void draw(void);
  private:                                      // hidden part of class circle
    int radius;                                 // encapsulated variable, radius
};                                              // end of class definition

class square : public shape {                   // inherit circle from shape
  public:                                       // visible part of shape
    square (int x, int y, int side);            // "constructor" for square
    void draw(void);
  private:                                      // hidden part of class square
    int side;                                   // encapsulated variable, side
};                                              // end of class definition
```

Often, designers and programmers using object-oriented technology confuse inheritance and association. This confusion sometimes leads to misunderstanding during the implementation process. It is especially difficult to differentiate between multiple in-


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**Not all object-oriented languages support multiple inheritance, and those which do sometimes introduce as many problems as they solve.**

heritance and association. The designer must understand that OOP for any system of size, includes inheritance and association.

Not all OOP languages support inheritance in the same way. SmallTalk is a single-inheritance language, but has excellent dynamic support for association via its message model. Eiffel is a multiple inheritance language, and it is usually necessary to incorporate multiple inheritance into any serious application design. C++ has multiple inheritance, but it is a more awkward construction than that in Eiffel. The new Ada standard supports single inheritance directly, but provides a clever designer with a capability for three styles of multiple inheritance.

The final verdict is not in on the necessity for multiple inheritance. We discover that all of the languages include the ability to combine classes to construct larger systems, so multiple inheritance may not be required. However, advocates of multiple inheritance insist it is easier to maintain a final design when it is based on multiple inheritance. Not everyone agrees with this point-of-view.

Examples:

We show an example of simple, single inheritance of a class in C++ (see *Figure 1*).

The same inheritance pattern using Ada could look like this (see *Figure 2*).

In the Ada and the C++ examples, the root class, Shape, can be extended to represent some other shape with corresponding operations. The Ada example should be easy for Pascal programmers to follow, and the C++ example should be easy for C programmers.

**FIGURE 2**

```
package Shape_Manager is
   type Shape is tagged record
      X : Integer;
      Y : Integer;
   end record;

   procedure Draw(S : Shape);

   type Circle is new Shape with record
      Radius : Integer;
   end record;

   procedure Draw(C : Circle);

type Square is new Shape with record
      Side : Integer;
   end record;

   procedure Draw(S : Square);

end Shape_Manager;
```

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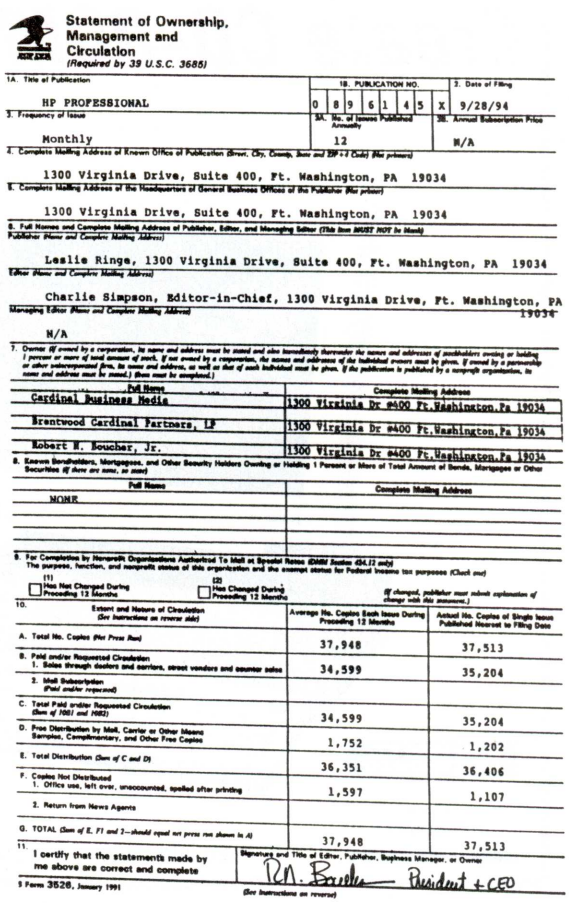
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Fred Mallett

# Looking For That Process

How often do you have to check for a process that is running? How many of you still do a **ps -options | grep process**? It is amazing how long it took me to finally make an alias to do this. What is really amazing is that it took another year before I finally got it in my shell startup file. So, if you have not done it yet, here are two aliases, one for C shell, one for Korn shell.

```
Korn Shell:       alias psg="ps -e|grep -i"
C Shell:          alias psg "ps -e|grep -i"
```

The command execution name is **psg**, which stands for process grep. It takes the output of a **ps** command, and uses **grep** to print only lines that contain the supplied argument. The **ps** options are for you to decide, the example uses **-e** to get information about all processes. The output is piped to **grep -i** to ignore case. You supply what process name, or partial name to supply on the command line. Here is an example using **il** as the search string, and the resultant output:

```
[785]$ psg il
270 ?        0:16 vuefile
401ttyp      2 1:05 ileaf6
416 ?        0:00 ileafnld
```

Notice that because only **il** was specified, an unwanted process, **vuefile,** also matched and was displayed.

## A PROGRAM BY ANOTHER NAME

Speaking of dual named binaries (for example, **uptime** and **w**), you can use the same technique in a shell script. There are many cases where you might develop a set of shell scripts, such as one script to compile data and another to generate a report from that data. Or, maybe a script to turn on a feature and another to turn it off. Scripts that have lots of similar code sections are prime suspects. You might have a bunch of small scripts, and the ~/bin directory is getting cluttered. In all of these cases, using hardlinks to provide multiple names for the same file may be the answer. Inside the file, the script will all be one **case** statement, used to determine which name the program was called with and to determine which code should be executed.

In the example, I took the alias mentioned above, and turned it into a shell script in a file called **psg**. Remember, the point here is how to use multiple names to get different flows of execution from a single script, not to laugh at my poor idea for an example. Here is the shell script:

```
#!/bin/ksh
progname=$(basename $0)
case "$progname" in
psg)
  ps | grep -i $1;;
apsg)
  ps -e | grep -i $1 ;;
esac
```

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This was put in an executable file called psg. Next, the following command was issued from the directory that **psg** lives in:

```
ln psg apsg
```

This created a hard link to the psg file, so that either name can be used to execute the same file. The name of the script was captured with the **basename** command to remove leading pathname components if used. The variable **$progname** feeds the case statement and calls **ps -e** if **apsg** was used to run the script, and **ps** if **psg** was used to call the script. Here is an example of the program running:

```
$ psg il #call psg
  401 ttyp2    1:05 ileaf6
$ apsg il      #call all psg (apsg)
  270 ?        0:20 vuefile
  401 ttyp2    1:05 ileaf6
  416 ?        0:00 ileafnld
$ ls -i ~/bin/psg ~/bin/apsg      #show file inodes
40033 /users/fred/bin/apsg        40033 /users/fred/bin/psg
```

The **ls** shows that the two names point to the same files. The **apsg** name makes the script run **ps** with the **-e** all process option.

## HOW BUSY IS IT

An often asked question is how loaded down a host is. There are many products available for purchase, both aftermarket and from HP, that will eloquently build and display a database of this kind of information. They can typically track and display system loading over long time periods. If you don't have the luxury to buy, install and learn to operate one of these great programs, there are many home brew methods available.

In past columns, some commands like **iostat** and **nfsstat** were discussed to look at I/O activity. Now, let's look at the **uptime** command. It does three things: display how long the system has been booted up (uptime); shows how many user licenses you have; and displays three load average numbers. The load numbers tell you how many processes on average were active during the sample period. The three numbers represent the last minute, the last five minutes and last 15 minutes. Here is the entire output of **uptime**:

```
"9:51am up 13 days 2:03, 2 users, load average: 0.65, 0.54, 0.48"
```

This shows that the host uptime was executed 13 days, two hours and three minutes ago. This host did not get any extra users licensed, so it has only the two default. Also, the average numbers of processes running in the last 15 minutes was .48.

It does not show which system resources a process is using, so many processes could be running and you could still get good system response. Typically, in my experience, newer faster workstations tend to get that mushy feeling of keyboard and mouse response when this number gets near four. On older systems, averages above two can start being noticable.

So, what good is **uptime**? Here are several reasons to use it. I often see people do perl/sed/awk/shell scripts to determine how long ago a host was booted. No need, run **uptime**. Another use is when a user complains of poor system response time. Use this to see if the machine is heavily process loaded right now. If not, suspect either network loading or remember that one CPU-bound process can take a machine down seriously in response time. You could even write a cron script that runs **uptime** every 15 minutes, cuts the last field and logs it to a file.

A 15-minute sample every 15 minutes means continuous data on a number of processes. This could them be summed and averaged over daily periods. Below is a series of cuts from the output to show only the load average part. I started Interleaf version 6, with nothing else running on the machine, and sampled over two minutes while it started. Note the difference in rate of change from the one minute to the 15 minute sample:

```
load average: 0.37, 0.18, 0.16
load average: 0.59, 0.24, 0.19
load average: 1.17, 0.44, 0.26
load average: 1.07, 0.43, 0.26
```

This is why I usually only save the 15-minute sample in a script, the one- and five-minute samples are for interactive viewing pleasure.

*Mallett's Internet address:*
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### Editor's Note

*This month, Fred Mallett introduces "You Said . . ." to our technical columns. "You Said . . ." provides a direct forum for you to ask questions, exchange ideas or share secrets with our writers and other readers. So take advantage of it.*

## You Said . . .

Thank you to the over 50 of you who E-mailed me a man page from other vendors' UNIX for the **w** command after mentioning that HP-UX does not have one for this variant of the **uptime** command, yet still ships the command. The answer to my question about the **-w** option in the August 1994 column came from Andrew Mossberg of Florida. He correctly states that because **uptime** and **w** are linked, the **-w** option is what "turns on" **w** behavior if **uptime** is the command used to invoke the code. (In other words, **uptime -w** equals **w**.) So the problem with the HP-UX man page it would appear, is that it does not cover any of the **-w** behavior options.

### TUNING A KERNEL

It seems there are a number of performance tuning books and articles out there. All of them talk about non-HP systems. So, I would like to hear details from any of you who have had success in tuning kernel parameters for performance on HP-UX. I will compile and sift the results into some kind of cookbook for a future article.

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### GEJAC Inc.'s ARSAP 3.0 Provides System Accounting

GEJAC Inc. released ARSAP 3.0 System Accounting, easy-to-use Resource Management and Chargeback software capable of operating across all the major System V- and BSD-based UNIX platforms.

ARSAP 3.0 provides the systems administrator with usage accounting information to perform resource management and to allocate or "chargeback" usage over an entire network of mixed platforms. ARSAP 3.0 accounts for the use of system resources by user project, section or department on any multiuser system or workstation in any application.

ARSAP 3.0's advanced chargeback capability supports an unlimited number of workstations, nodes, users and projects, allowing administrators to allocate system costs within any parameters they choose. The system provides an unlimited number of shifts such as prime time, non-prime time or weekends, with separate rates for each. Rates also can vary by node, user or project.

ARSAP 3.0 operates on UNIX systems or workstations from Apollo, Convex, Cray, DEC Alpha OSF/1 and Ultrix, HP-UX, IBM RS/6000, Intergraph, SCO UNIX, Sequent Dynix/ptx, SGI Irix, SunOS and Solaris, Solbourne and Unisys Dynix/ptx.

Contact GEJAC Inc., 8643 Cherry Lane, Laurel, MD 20707; (301) 725-2500.

***Circle 397 on reader card***

### Imageware Ships Surfacer For HP And Sun

Portable Graphics announced that Imageware Inc. shipped accelerated versions of its Surfacer v3.1.3-D surface modeling software

for HP and Sun workstations. Imageware used the NPGL library from Portable Graphics to port the X Windows/Motif version of Surfacer to the HP And Sun platforms where it runs at accelerated speeds. NPGL exploits the underlying graphics acceleration provided by workstations from HP, Sun, IBM and DEC.

Imageware's Surfacer provides powerful tools for point processing, NURBS curve and surface generation, geometry analysis and geometry input/output. These tools allow users to create and manipulate NURBS geometry and to take advantage of advanced 3D digitizing technologies, such as laser or optical scanners, as well as laser, sonic, magnetic and CMM contact probes.

Contact Portable Graphics Inc., One Technology Center, 2001 Donley Dr., Ste. 365, Austin, TX 78758; (512) 908-4700.

*Circle 396 on reader card*

## Momentum Provides Intelligent Network Gateway

Momentum Systems Ltd. announced the Intelligent Network Gateway for TCP/IP networks. This version is expanded to allow for full network management in a TCP/IP environment.

The Intelligent Network Gateway supports three concurrent categories of data transfer. The first is traditional store and forward batch communications with unattended autoreceive, autodial delivery and mailbox. Second is flow-through communications for time-sensitive files or messages that require immediate upload or download to the host processing system. The third category is rapid response communications that provide immediate response to requests.

With a UNIX host system, the Intelligent Network Gateway allows for management of all file traffic in TCP/IP environments. It supports the following communications protocols: BSC; ASYNC; SNA 3770 or LU6.2; X.25; OSI X.400; and OSI FTAM.

The Intelligent Network Gateway manges the traffic between many remote endpoints, with a variety of protocols, and a single or multiple host processing environment.

Contact Momentum Systems Ltd., 2 Executive Dr., Ste. 10, Moorestown, NJ 08057; (609) 727-0777.

*Circle 395 on reader card*

## SE Technologies Offers Conversion Services

SE Technologies Inc. announced its provision of conversion services for companies who are looking to migrate from Classic MANMAN on HP 3000 or DEC VAX platforms to UNIX environments.

Contact SE Technologies Inc., 15 Bank St., Stamford, CT 06901; (203) 357-1772.

*Circle 394 on reader card*

## Versant Introduces V3.0 of C++ ToolSet

Versant Object Technology released version 3.0 of application development toolset. The ToolSet 3.0 release provides additional reporting capability as well as significant improvements in performance and GUI building power.

The Versant C++ Application ToolSet is a family of development tools that makes it easy to develop production applications using C++ and the VERSANT Object Database Management System.

The three components are: VERSANT Object SQL merges the query and update capabilities of standard SQL with the flexibility of object manipulation to support decision support and analysis for object databases; VERSANT Screen facilitates building graphical applications by including a C++-based scripting language for rapid application development; and VERSANT Report is an end-user graphical report writer that makes customized reporting quick and simple.

The ToolSet will be available on Sun SPARC workstations followed by HP 9000 Series 700/800, IBM Power and RS/6000, DEC Alpha, SGI and Microsoft NT. Prices for the tools start at $600 per seat.

Contact Versant Object Technology, 1380 Willow Rd., Menlo Park, CA 94025; (415) 329-7500.

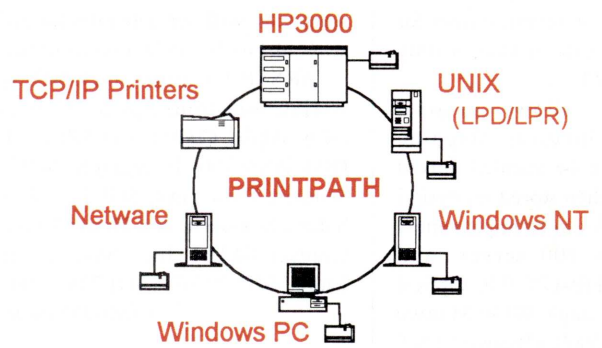
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## Mitchell Humphrey & Co. Releases F/S Warehouse

Mitchell Humphrey & Co. released F/S Warehouse, a data warehousing system designed to meet the information needs of managers who require high-speed access to financial and statistical data.

F/S Warehouse is an information reporting and decision support systems that accumulates financial and statistical data by time period. It is designed with a uniquely flexible indexing technique that permits high-


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Analysis functions include production, sales, purchasing, project, employee time, maintenance and customer service. Data can be retrieved for a single record, a group of related records or a summarized group of records.

F/S Warehouse is fully portable across the HP 3000 and HP 9000 environments. Price ranges from $25,000 to $75,000.

Contact Mitchell Humphrey & Co., 11720 Borman Dr., St. Louis, MO 63146; (314) 991-2440.

***Circle 392 on reader card***

## Centigram Announces Software Release 5.04

Centigram Communications Corp. announced software release 5.04, which support several new products and features on Centigram's Adaptive Information Processing (AIP) platform.

Release 5.04 supports OneView, an optional multimedia desktop product that integrates voice, fax and compound voice and fax messages on the user's PC. Another optional product supported by Release 5.04 is CallAgent, an advanced call processing application.

Release 5.04 includes a number of enhancements to FaxMemo that makes it easier for users to send and retrieve fax messages. Optional full-set and hotel prompts also are available for VoiceMemo and FaxMemo in 14 languages.

Also, 5.04 includes: administrative enhancements including an optional Alarm Reporting Monitor; and a security enhancement that is a functionally partitioned system administration.

Finally, Centigram has enhanced its disaster recovery capability by providing passcode broadcast, in addition to name speed, message and greeting broadcast, to an alternate system when the primary system fails.

Contact Centigram Communications Corp., 91 E. Tasman Dr., San Jose, CA 95134; (408) 428-3722.

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## Automated Technology Expands Its ERDB

Automated Technology Associates (ATA) expanded its ERDB entity-relation database management system to support applications that need high-volume data storage combined with high speed and highly predictable response. ERDB Disk, the disk-optimized version of ERDB, combines management of terabytes of storage with real-time performance that has been benchmarked at 50 to 1,200 times the speed of RDBMSs in a variety of applications. In addition the new release offers a highly-efficient mated-pair backup option, and expands application development support by incorporating the X-Open interface standard to provide access to a large and growing number of report generator and development environment products.

ERDB Disk allows developers and users to take advantage of memory and disk storage to optimize real-time predictable response and high-volume, online storage. It accesses all database fields through the memory cache.

ERDB is a post-relational fourth normal form database that physically maps entity relation diagrams without the translation required by relational database architectures.

ERDB licenses begin at $10,000 and ERDB Disk licenses begin at $15,000. The Mated-pair Backup Option costs $7,500.

Contact ATA, 8888 Keystone Crossing, Ste. 600, Indianapolis, IN 46240; (317) 573-9000.

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## LOOX Software Enhances LOOX 3.0

LOOX Software introduced release 3.0 of its object-oriented graphics development tool for the X Window system. It allows developers to create interactive graphics for UNIX applications, using a graphical editor to accelerate the graphics design, and a C function library to define the behavior of these same graphics.

LOOXLib, the C library, comes with an entire class of ready-to-use dynamic objects. These standard objects come with preprogrammed behavior. It contains two new classes of vector objects, the PARALLELOGRAM class and the SUBDRAWING class. LOOXLib also incorporates new methods and resources, creating more highly customizable vector objects.

LOOXMaker now generates code, making it easier to link the interface to the application, or modify the interface in code form. It enables the developer to immediately test the newly created or modified drawing. It also incorporates a drawing browser, which displays the actual hierarchy or the layers of graphical objects in a drawing.

LOOX is available for SunOS 4.1.x, Solaris 2.x, HP-UX 9.0, AIX 3.x, SGI Irix, Solaris x86, UnixWare, SCO and X Terminals with X11R4 or X11R5. It requires Motif, X11R4 or X11R5. A development





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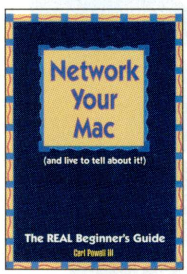
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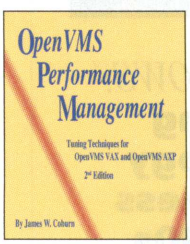
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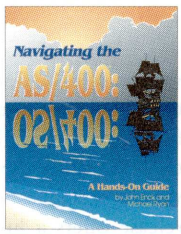

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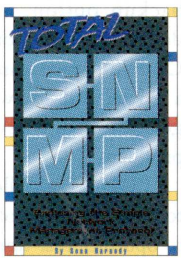

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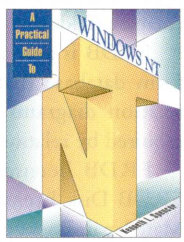

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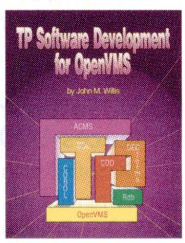

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## SRN Provides TRASHMAN

Software Research Northwest (SRN) announced TRASHMAN, a file recovery tool for MPE/iX that "unpurges" files that were inadvertently purged. With TRASHMAN, all you need to do to get a file back is to type "recycle" at the system prompt and the file is back in exactly the same state it was in when it was lost.

Whenever a file is purged, TRASHMAN renames the file to a special account called Landfill. Files that have been in the Landfill over a set time period can be removed automatically. TRASHMAN works transparently, selectively extending recovery protection based on user, account and file specifications. It features pull-down menus, function key support and extensive online support to ease the tasks associated with managing TRASHMAN on your system.

A TRASHMAN license for one CPU costs $960. Licenses for each additional CPU cost $480.
Contact SRN Inc., 17710 100th Ave. S.W., Vashon Island, WA 98070; (206) 463-3030.

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## Configuration Utility Available From HP

HP introduced a Windows-based network-level router configuration utility — Network Configuration Manager. HP also announced Traffic Monitor for Windows and UNIX system-based platforms, an inexpensive network-traffic monitoring tool.

Network Configuration Manger lets network mangers map the entire network, assign addresses, check for duplicate addresses and errors and configure all AdvanceStack routers from a single PC.

Once the network is configured, Traffic Monitor for Windows and UNIX observes network traffic and can alert the network manger to potential problems before they affect network availability. Network managers can switch from a full internetwork view to a specific router view to isolate and locate network traffic problems with just three clicks of the mouse.

Network Configuration Manager is included free of charge with all HP AdvanceStack routers. HP OpenView Traffic Monitor for Windows costs $2,999 and for UNIX costs $3,999.


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## Unison Software Delivers Load Balancer 4.01

Unison Software announced the availability of a new release of its workload distribution product, Load Balancer 4.01. The key feature in this release is a recovery mechanism, which is essential for running mission-critical applications in a commercial environment. This mechanism gives Load Balancer a "memory" which allows it to remember what applications and programs were in process prior to system failure.

Load Balancer provides automatic queuing and distribution of jobs across heterogeneous UNIX networks, improving network performance by putting idle computers to work and reducing the load on busy ones.

Load Balancer is available on IBM AIX, HP-UX, and SunOS and Solaris. Price is $895.

Contact Unison Software, 675 Almanor Ave., Sunnyvale, CA 94086; (408) 245-3000.

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# HARDWARE

## Acronym Inc. Premiers Netcool

Acronym Inc. launched Netcool, an integrated range of network management products for distributed, enterprise-wide computer systems and network management.

Netcool/OMNIbus transforms fragmented, tactical management domains into a coherent, strategic network management view. The software collects alert information from SunNet Manager HP's OpenView Node Manager and IBM's NetView/6000 network management systems, as well as other management applications, and displays this data graphically in a single management view. It features a hierarchical, distributed object-oriented architecture, Motif graphical display tools and plug-and-play installation.

NetCool/LegacyWatch allows non-SNMP computer equipment to be managed by open systems platforms such as SunNet Manager, OpenView, NetView/6000 and Netcool/OMNIbus. Users can now manage character-terminal and non-networked devices using UNIX-based management tools.

Netcool/Tools is a value-added applications suite extending the management capabilities of SunNet Manager. Replicant enables SunNet Manager to function as a multiuser system. AlarmList provides a chronological, color-coded list of network alerts in a scrollable OpenLook window. SyncroPing reduces the load on the SunNet Manager host by conducting asynchronous pings on a large number of network nodes. CommandCenter provides a secure, customizable, graphical front-end to SunNet Manager for improved management control. Contact Acronym Inc., 44 Montgomery St., 5th Fl., San Francisco, CA 94104; (415) 955-2746.

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## LANCAST Introduces 4398 SSSUPER Hub

LANCAST announced SSSUPER 24 + 3 Port Smart Hub. The 4398 SSSUPER Hub is: stackable, switchable, segmentable, upgradeable, protocol proficient (SNMP), expandable and redundant.

Three AUI ports on the back of the unit provide tri-channel, switchable segments for increased bandwidth plus global/local load sharing capability. It can support as many as three segments per hub and up to 15 segments per stack. Redundant SNMP agent installation provides fault tolerant network management capability.

The SSSUPER Hub with the AUI ports on the back of the unit also can be used for the attachment of transceivers. It features an automatic stack configuration interface allowing users to build from a 24 + 3 port unmanaged system to a fully managed system consisting of a single hub master and up to four standard hubs — without DIP switches. Contact LANCAST, 10 Northern Blvd., Unit 5, Amherst, NH 03031; (603) 880-1833.

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## Micropolis Expands RAIDION Disk Arrays

Micropolis Corp. introduced new enhancements for its RAIDION family of fault-tolerant disk arrays providing additional manageability and flexibility for businesses with open architecture client-server environments.

In addition to the desktop models, RAIDION disk arrays are now available in 3.5- and 5.25-inch drive modules that can be installed into existing 19-inch rackmount cabinets.

For the software-based RAIDION disk array, the new RAIDWARE v4.0 for NetWare provides advanced media management such as Disk Patrol, and support for future network management and messaging capabilities.

New host administration utilities for the GANDIVA controller-based RAIDION feature GUI for NetWare environments, providing users easy subsystem configuration and manageability. The utilities also are available for Mac environments and are in development for HP-UX, UnixWare, Solaris, SCO, AIX and Windows NT.

Prices for the rackmount RAIDION drive modules start $2,320 for a 3.5-inch, 1.7 GB module. RAIDWARE v4.0 for NetWare costs $495.

Contact Micropolis Corp., 21211 Nordhoff St., Chatsworth, CA 91311; (818) 709-3300.

*Circle 384 on reader card*

## Canary Communications Offers IDA3500

Canary Communications introduced the IDA3500 Intelligent Disk Array, a RAID system that is operating system- and platform-independent, and supports RAID levels 0, 1, 3, 4 and 5. The IDA3500 can provide multiple RAID levels on a single rank of drives, allowing users to tailor fault-tolerant solutions to meet their specific storage needs.

The IDA3500 is compatible with a variety of Fast SCSI-2 hard drives, including HP, IBM, DEC, Seagate and Quantum, allowing users to purchase drives of their choice. The product supports all computing platforms and operating systems including HP, IBM, Sun, DEC, SGI and IBM PC-compatible vendors, and functions in all UNIX, Novell, NetWare, Microsoft Windows NT and IBM OS/2 environments. Price is $16,995.

Contact Canary Communications, 1851 Zanker Rd., San Jose, CA 95112; (408) 453-9201.

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## Xerox Corp. Produces High-Resolution Printer

Xerox Corp. announced a high-resolution desktop laser printer designed for specialized graphics applications and printing documents up to 11 x 17 inches.

The Xerox 8088 is a desktop graphics printer that provides the type of high-quality resolution required for technical documents, presentation charts and graphs, intricate line drawings and photographic reproductions. The unit features built-in Adobe PostSript Level 2 and PCL5E support for text and CAD files.

It is capable of printing at true 800x800 dpi resolution. The 800x800 dpi is automatically activated with the installation of 16 MB of additional memory. The additional memory also activates the unit's HP-GL/2 support, enabling the 8088 to handle more sophisticated CAD plotting applications.

The 8088 has a serial and bi-directional Centronics interface for PC, Mac and UNIX-based workstation connectivity. It also features

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This month's issue contains many advertisements for hardware and software products available for your HP systems. Your investment in these products today could mean a more lucrative future for your company. Use the information below to learn more about the advertisers' offerings, then use the reader information card to initiate your direct link to valuable information about these advertisers' products.

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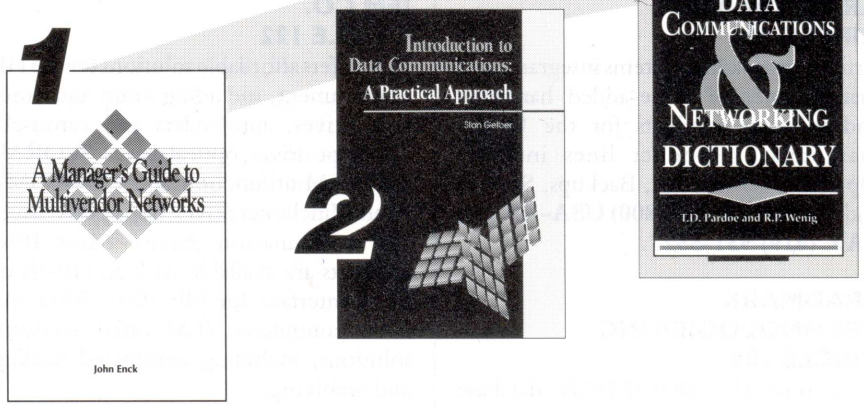
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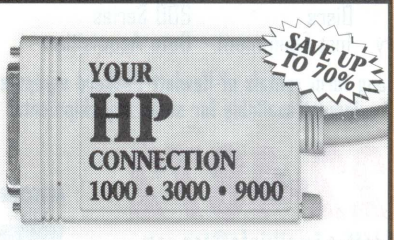
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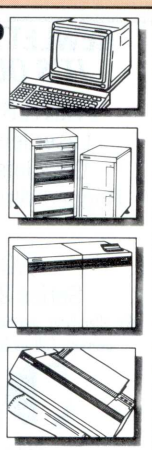
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| Reader Service Number | | Page |
|---|---|---|
| 203 | Abtech | 55 |
| 104 | Adager | 10 |
| 163 | Aldon Computer Group | 47 |
| 242 | Artecon | COVER 2 |
| 171 | Black River Computers | 63 |
| 108 | Bradmark Technologies, Inc. | 21 |
| | Cardinal Business Media | 62, 66 |
| 274 | CenterLine Software | 27 |
| 454 | Computer Marketing International | 54 |
| 232 | Concorde Technologies | 53 |
| 160 | Cort Directions | 63 |
| 205 | CSU Industries | 41 |
| 240 | Dataram Corp. | 6 |
| 192 | FutureSoft | 31 |
| | IBM | 12, 13 |
| | IBM | 25 |
| | IBM | 50, 51 |
| 122 | IEM, Inc. | 2 |
| 281 | Insignia Solutions Inc. | 23 |
| 270 | Kingston Technology Corp. | 1 |
| | Lantronix | ONSERT |
| 195 | Lawson Software | COVER 3 |
| 123 | M.B. Foster Associates | 61 |
| 472 | MiniSoft, Inc. | 4 |
| 154 | Mitchell Humphrey & Co. | 43 |
| 246 | Newport Digital Corporation | 9 |
| 258 | O'Pin Systems | 37 |
| 451 | RAC Consulting | 60 |
| 273 | Spectrum Trading | 14 |
| 214 | Texas ISA, Inc. | 15 |
| 137 | Technical & Scientific Applications (TSA) | 67 |
| 499 | Unison Software | 17 |
| 225 | Visual Numerics | 19 |
| 263 | Walker Richer & Quinn Inc | COVER 4 |
| 194 | Western Scientific | 34 |
| 256 | Wordperfect Corp | 33 |
| 253 | Workstation Solutions | 49 |
| 227 | XPoint | 5 |

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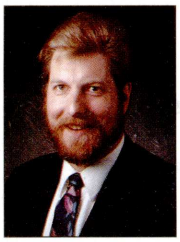
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# The Best Laid Plans

## Project Planning Is As Easy As 1. . . . . 2, 3, 4, 5.



Project planning drives me nuts. It seems inevitable that you'll either underestimate the amount of work that has to be done, or misjudge how long it will take to do it. Is there anything that can be done about it? Well, to start, you ought to know the five rules of project planning.

The time-honored approach to project management is to break a job down into all of its little component pieces, plan the hell out of each of them and then add the whole mess together. With this approach in mind, the key to a good plan is more detail.

Remember calculus? You may recall that you can calculate the area under a curve with the integral of the equation that describes the curve. If you're not sure you know what you're doing — and I can assure you, I never was — you also can approximate the answer by plotting the curve on graph paper and drawing a bunch of rectangles under it, and adding together the areas of all the little boxes.

The trick is, the more rectangles you use and the smaller they are, the more accurate your answer will be. The same must be true for project planning and brings up the first rule of project management: Detail is good. The more tasks you put into a plan, the better your estimate will be.

This begs the question: How much detail is enough? With an approach like function-point analysis, you decompose a project down into little itty-bitty pieces, called — you guessed it — function-points. A function-point might be a report, a database update or a screen display. Whatever it is, it should be the smallest meaningful unit of work you can come up with.

The good news is that it's fairly easy to estimate how long it will take to code each function-point, with pretty good accuracy. Then, all you have to do is add up the function-points in each program and all the programs in a system, and voila! You have a project plan.

The bad news is that to get down to that level of detail, you have to do a lot of really fussy systems analysis — the kind of systems analysis that you never seem to have the time to do. Oh well. If you can't do the analysis, just add in enough stuff so you've got a good cushion.

I actually had the luxury of planning with function-point analysis once, and I was amazed at the results. I got absolutely the best plan I have ever developed, and the time estimate was downright scientific.

But, there were some problems with it. In the first place, how often can you spec a project to that level of detail? I got lucky, because a good chunk of the project was already done, I had a decent spec to work from, and the users' requirements were clearer than is usually the case.

Even so, I still had to go through everything a bunch of times to make sure I didn't miss anything. Meanwhile, my boss, more interested in results than good form, was getting impatient. I had unknowingly violated the second rule of project planning: the plan ought to take less time than the job you're planning. Ideally, a plan should be almost instantaneous.

Then, when I dropped a huge pile of project plan on his desk, he took one look at it, and told me to cut it down so it would fit on one page. I had violated the third rule: Project plans must fit on one page and provide as little detail as possible. That way, everybody thinks they understand it, and nobody asks too many embarrassing questions about specifics.

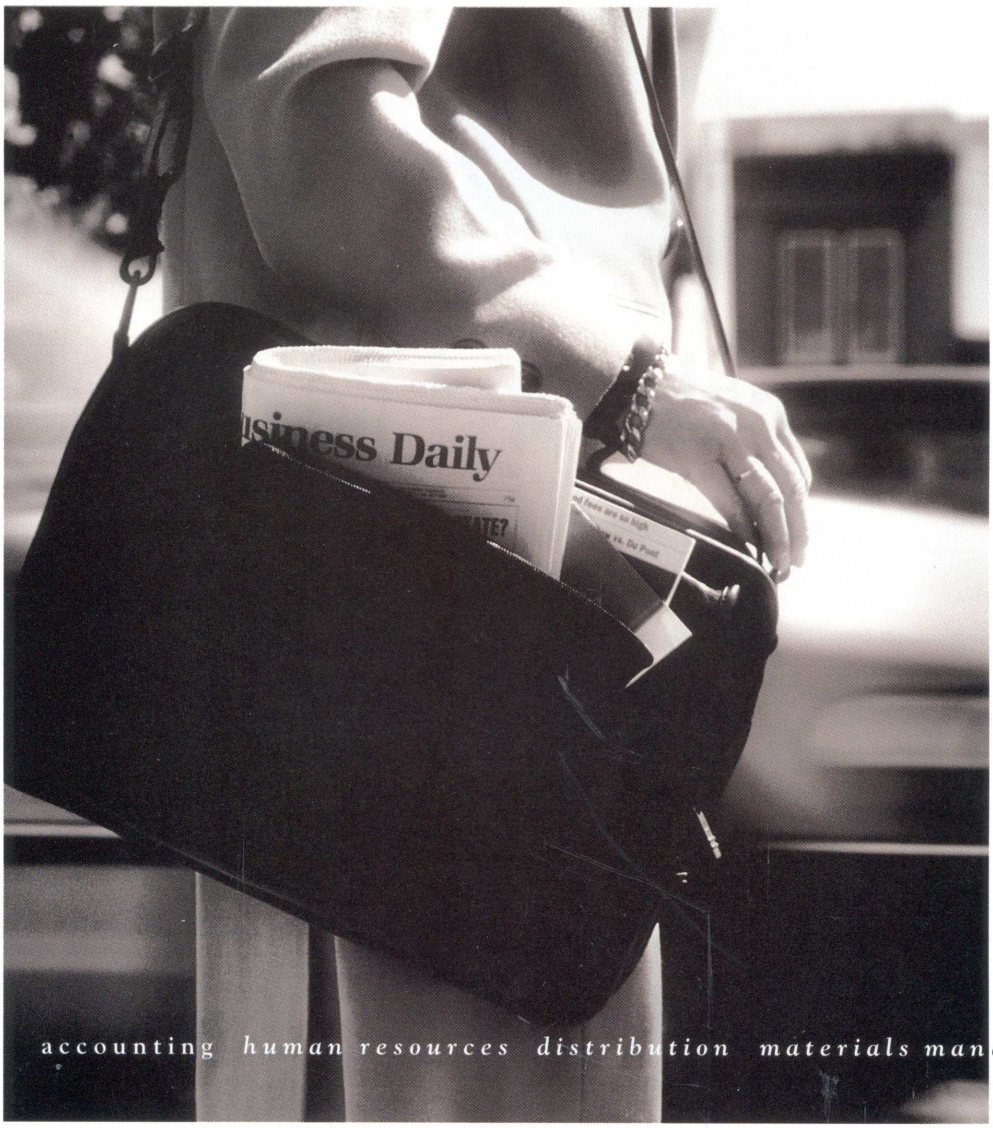
I could live with that. I was the only one who really needed all that detail, and management would do just fine with a summary. But almost as an aside, he told me to cut my six-month timeline in half, because that was what he had already committed to. Here I had violated rule four: Management knows how long they want the project to take, and that's what your plan had better say.

Which brings up rule five: All project plans are wrong. At least, if you paid any attention to the first four rules.

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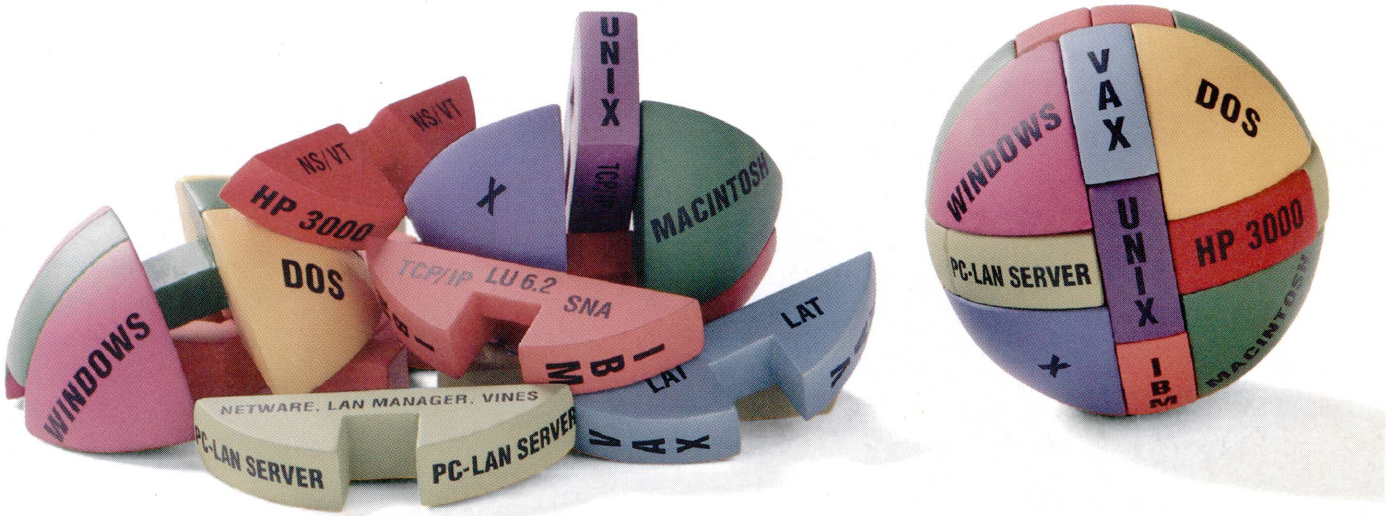
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